FEB 25 19

Annual Meeting, Regina, June 17th, 18th, 19th, 1931

Volume XXII
No. 2

FEBRUARY
1931

Canadian Public Health Journal

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CANADIAN PUBLIC HEALTH JOURNAL

VOL XXII February 1931 No. 2

National Health Insurance Medical Service in Great Britain

R. W. HARRIS*

London, England

IT is difficult within the limits of a single article to give an adequate description of the Insurance Medical Service, and still more difficult within such limits adequately to comment on or to offer criticism in the light of twenty years' experience. Description and comment alike must suffer from compression.

National health insurance in this country made a bad start, from which even to-day it is still slowly recovering. For a moment, at the time of the introduction of the Bill in the House of Commons early in 1911, the welcome to the new scheme was warm and general; but the welcome was not for long. Political considerations, the increasing complexity of the details which became evident as the discussion on the Bill developed, the manifest hostility of large sections of the medical profession, the impatience of employers for what they were taught to regard as a new "tax"—all combined to make the early days of administration of the new Act thorny and troublesome. Medical practitioners were confronted with service under a scheme which represented to most of them a veritable revolution in the conditions of medical service. Notwithstanding this, the chosen leaders of the profession, the British Medical Association, sufficiently appreciated the fact that the new system would provide for the medical treatment of the whole working population under conditions which, both for doctor and patient, were greatly superior to the conditions of contract-practice under which a substantial section of the working population had hitherto been treated. It was, therefore, worth while to make the new scheme work if certain *cardinal points* could be secured. They accordingly imposed certain conditions upon which the medical profession would undertake to work the new Act, conditions which were designed as far as possible to preserve in a national service as

**The Editorial Board is greatly indebted to Mr. Harris for preparing this article. Mr. Harris, formerly an Assistant Secretary in the Ministry of Health, London, is now Secretary of the London School of Hygiene and Tropical Medicine, and for the past three years has been Chairman of the London Medical Service Sub-Committee.*

many as possible of the features of private practice, and to ensure that in the new national service the medical profession had as large a share as possible in the guidance, if not the control, of the administrative machine. It must be fairly admitted that in both respects the scheme secures to the medical profession all that can reasonably be expected, and that on each occasion in the last twenty years when amendments have been made the advice and assistance of the body representative of the medical profession has been sought at every stage and the medical profession given an increasing share in the administration.

One further fact with regard to the bad start of the new service has to be recorded. During the final stages of the passage of the Bill through Parliament and immediately it became law, the prospect of the new medical service being still-born became a serious menace owing to the stubborn resistance of the medical profession to the proposed rate of remuneration. If the menace had become a reality, the funds available for medical service in the scheme were demonstrably ample for an effective and well-paid salaried service; possibly the knowledge of this, coupled with the fact that the extra exchequer grant which had been offered was known to represent the limit to which the Government was prepared to go, combined to bring about a collapse of the opposition of the medical profession at the eleventh hour. The doctors signed the agreements for service almost precipitately, and everywhere, with a few negligible exceptions where the difficulties were surmounted after a short interval, a full and effective service was secured.

THE PRINCIPAL FEATURES OF THE MEDICAL SERVICE

It will appear in the course of this article that the following are the essential features of the insurance medical service:

(1) The service is a general practitioner service (excluding maternity benefit).
(2) Every insured person (which means the great majority of employed persons) is entitled to the service wherever he may be in Great Britain.
(3) Every qualified medical practitioner is entitled to put his name on the medical list and to take part in the service.
(4) Free choice of doctor by patient and of patient by doctor.
(5) The dispensing of prescriptions by pharmacists.
(6) The issue of certificates of incapacity for work to enable the insured person to draw cash payments during illness.
(7) The payment of the doctor by a quarterly cheque representing a capitation fee for each insured person on his list, well or ill; consequently no fee-charging or account-keeping.
(8) Central and local administrative control; with the medical profession closely consulted and given a share in the various branches of the administration.

The Panel Doctor

I have cited at the outset the circumstances in which the national health insurance scheme made a bad start with some detail, because they combined to give to the label "panel doctor", which was invented in the popular press at the time, a certain depreciation which persists to this day, fostered by the amount of publicity which the black sheep in any flock always receive, while the quiet, patient, and conscientious service of the great body of practitioners is taken for granted. I have always maintained, and I shall continue to do so, that the people who so readily criticize the panel doctor are really criticizing the medical profession as a whole, seeing that the large majority of general practitioners in this country, especially in industrial areas, are engaged in panel practice to a greater or less degree. Whether sub-consciously a doctor is less keen, less vigilant, less enthusiastic in his daily work when he is paid by an insurance premium for his patients whether they are well or ill, instead of for each separate service rendered, is a question which probably cannot be satisfactorily answered even by the doctors themselves. In so far as a medical practitioner is governed in the performance of his duties by other considerations than the sheer love of his calling, it must at least be borne in mind that there are stimulants in a public service towards good work—or, at any rate, away from bad work—which are not present in the conditions of private practice.

THE GENERAL CHARACTER OF THE INSURANCE SCHEME

The insurance scheme as a whole is maintained by a system of compulsory weekly contributions and supplemented by grants from the national exchequer towards the cost of the benefits. Broadly, every person employed under a contract of service is insured. This means that there are insured some 15,000,000 workers. In the case of non-manual workers, insurance ceases when a limit of salary of £250 per annum is reached. The principal benefit secured is the right to medical treatment when the worker is ill and to a certificate from his doctor that enables him to draw cash payments during illness. The cash benefits are weekly payments during sickness or disablement, except for the first three days of illness, and payments to the working woman or the wife of a working man during her confinement. The medical benefit does not include a maternity service, but is otherwise a general practitioner service. The link between the medical service and the cash benefits is the certificate of the doctor that the insured person is incapable of work. It will be convenient to deal at once with the question of the medical certificate, not as being first in order of importance, but because, as stated, it is the connecting link between the medical service and the scheme of cash benefits; we can then omit any further consideration in this article of the question of the cash benefits and examine in some detail the question of the medical service.

Certificates of Incapacity for Work

The cash benefits are administered almost exclusively by societies, which all insured persons are encouraged to join, approved by the Minister of Health and known as "Approved Societies". These societies are formed mainly by the old friendly societies, trade unions and industrial insurance companies, and are self-governing bodies with, as we shall see, a controlling voice also in the administration of medical benefit. The insurance medical certificate is given on a prescribed form and is a declaration by the doctor that he has examined the patient and that he or she is, in that doctor's opinion, incapable of work. The certificates are given at weekly intervals so long as is necessary, and a "declaring-off" certificate is required when the patient is fit to resume work. The first concern of the doctor must, of course, be to see that no insured person is at work when he is not fit, but he has also to realize that every certificate which he gives is in substance a cheque entitling the insured person to payment out of public funds, and the doctor must, therefore, give his certificate fairly and conscientiously. The increasing demands made upon National Health Insurance sickness funds in recent years have been the subject of much concern to the authorities. The appointment of Regional Medical Officers of the Ministry as referees on the subject of incapacity for work (their principal but not their only function) has led to an enormous number of claims coming under review, and, in quite a large proportion of the cases sent to these referees, the patient who has been certified by his panel doctor to be incapable of work has either not presented himself for examination by the referee or on examination has been found not to be incapable of work. (In fairness it must be recognized that some days elapse between the case being certified and the date for the referee's examination). This machinery results in a substantial check on loose certification, but has been found to be insufficient, and the possibility of further checks has recently been explored between the Ministry and the British Medical Association and procedure devised for reviewing not only individual cases of certification, as at present, but a doctor's whole record in this respect, as compared with that of his fellow-practitioners. This procedure is embodied in new regulations. The disciplinary action which is at present taken in regard to improper certification is not, and can never well be, directed to the question whether the doctor is right or wrong in saying that a patient is incapable of work, but to other considerations involving more obvious offences of which the most common example is that of a doctor saying that he has examined the patient on a certain date and found him to be incapable of work when he has not in fact examined the patient on that occasion.

The new regulations provide that where, after a preliminary investigation, it appears to the Minister that there is a *prima facie* case indicating that a doctor appears to have failed to exercise reasonable care in the issue of certificates, the Minister may refer the matter for

consideration to the Panel Committee, or to an *ad hoc* committee of insurance practitioners from any two or more areas. Disciplinary action in the form of a deduction from the doctor's remuneration may follow after the doctor has been afforded an opportunity of making representations to the Minister and the Minister has consulted an advisory committee on which insurance doctors are represented.

The Doctor's Responsibility for the Care of the Insured

The care of his patient must be a doctor's first consideration, and this is equally true of private practice and an insurance system. It is also to the doctor's interest under the insurance system; critics of the system commonly overlook the fact that a doctor who is paid by a capitation fee for every person on his list, whether well or ill, has a real inducement to keep his patients well.

As the care of the patient is an individual doctor's first responsibility, so it must be the concern of the National Insurance Scheme to secure for every insured person, wherever he may be in the country in which the scheme is the law of the land, immediate medical attention when he requires it; and the National Health Insurance Scheme is so designed. Every insured person, while he remains insured (and this covers considerable periods when there are unpaid contributions owing to unemployment) is entitled to medical benefit. The sole qualification is the fact that he is insured. The doctors collectively have a responsibility for the treatment of the whole insured population. This is effected in the following way:

> An insured person is entitled to select from a list or panel of doctors in the area (who have undertaken insurance practice by signing agreements) any doctor as his regular medical attendant provided that doctor is willing to put him on his list. There is thus free choice of doctor by patient and of patient by doctor. If the doctor to whom application is made is not willing to accept the insured person on his permanent list, he has to give him such treatment as is immediately required and advise him of the steps necessary to secure his being placed on some other doctor's list; if an insured person has been refused acceptance he must not be left in doubt as to what to do next. If, therefore, he is not accepted by a doctor—an unlikely contingency—he may be assigned to some doctor by the local authority, the Insurance Committee, to which reference is made later in this article. Further, when the insured person is on a doctor's list, he must not be left without treatment if his own doctor is not available, and the scheme, therefore, provides for treatment to be given by any insurance practitioner in an emergency or when the insured person is staying away from home. The practitioner is entitled to require the insured person to produce the medical card—which is issued to every insured person and which, therefore, ought to be in his possession—either as a proof of his identity if he claims to be on that practitioner's list or, if he is not, as evidence of his title to benefit. When the doctor is in doubt as to the title to benefit of a person who represents

that he is an insured person, he is required to give any necessary treatment and may charge by way of returnable deposit a reasonable fee, giving a special form of receipt to the patient to enable him to claim repayment. Payment for the treatment of another doctor's patients in any emergency or when away from home is provided for by machinery which need not be described here.

Change of Doctor

With regard to free choice of doctor, the system at first in force provided that a change within the same district could only be effected at the end of each half-year. This was abandoned after some years as unsatisfactory in favour of a system which provided for unrestricted change of doctor at any time, and this after a fair trial was in turn replaced by the present system which secures that an immediate change may be made at any time with the consent of the two doctors concerned, but that, failing such consent, an interval of 14 days must elapse before the change becomes effective. If the patient during that time wishes to be treated by the new doctor, that doctor is entitled, if he so wishes, to charge fees for his services, as though he were treating a private patient. Even the present system does not seem to have reached finality as the possibility of a further change is at least under consideration in responsible quarters,—a change, in the direction of longer notice, to which the Insurance Acts Committee of the British Medical Association may be expected to be opposed, as an unnecessary differentiation from the conditions of private practice.

The Improper Charging of Fees

The question of fee charging is a cause of stumbling to many doctors who do not wish to be imposed upon or are perhaps a little over-anxious that they shall not render any services for which they are not paid. A doctor must not demand or accept any payment in respect of the treatment which he is required to give to any person who is on his list or who represents that he is an insured person, except as already stated, by way of deposit in cases of doubt. It is for the applicant to represent that he is an insured person, but the wise doctor will always put this question "beyond a peradventure", *e.g.*, by asking the nature of the patient's employment. Some misguided insured persons will insist upon treatment as private patients, and, when a doctor so treats for a fee an insured person who is not in fact on his list, he is not committing a technical breach of his terms of service. But it is hardly necessary to say that the frequent treatment of insured persons as private patients is bound to have unfortunate reactions on the good name of the service and to prejudice the position of the doctor concerned. If an insured person clearly understands from his doctor that there will be no difference in the kind of treatment that he will receive, whether he is treated as a private or as an insured patient, and that his doctor is already paid by way of insurance pre-

mium, he is hardly likely to want to make a fresh payment when he falls ill. Seeing that doctors as a general rule take a wide and generous view of their collective responsibility for the treatment of the insured population, it is possible to add without offence that what may be called "fee-snatching" in so far as the doctor just keeps within the letter of his agreement, is at least open to the charge of meanness and, when the agreement is broken, constitutes an offence which is properly regarded as a serious one, bringing discredit on the service.

The Definition of Duties in the Agreement

The terms of the doctor's agreement, which are embodied in regulations made by the Minister of Health, define the persons for whose treatment the practitioner is responsible, and the evidence of the person's title to obtain treatment, and to these reference has already been made. The range of service which is to be given is defined as "all proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess". In other words, the service is a general practitioner service. If it is claimed by a practitioner that the service which he renders demands special skill and experience, the onus is laid upon him of proving that he possesses such skill and experience, and that the operation or other service is outside the above definition. When these questions are raised by an insurance practitioner, they are settled under the regulations in the first place by his medical colleagues in the area or may be sent ultimately to special referees.

A practitioner's general duties towards his patients comprise attendance at his surgery at his registered hours, which must provide satisfactory facilities, the provision of proper and sufficient surgery and waiting-room accommodation, an obligation to "visit and treat a patient whose condition so requires" at any place within the district in which the practitioner has undertaken to visit patients, the issue of medical certificates free of charge in accordance with the rules, the writing of prescriptions for drugs and appliances, the keeping of records of treatment of his patients, the making of reports to medical officers of the Ministry where the doctor's certificate of incapacity for work has been called into question, and various other matters. The conditions under which deputies, assistants or partners may be employed, while the overriding responsibility of the practitioner himself is preserved, are all carefully set out in the regulations; these provisions will all be found to be such as may reasonably be looked for in any scheme of this kind, and, within my own experience, are sufficiently elastic in their operation.

Prescriptions—Excessive Prescribing

The statement that the doctor is required to write prescriptions for his patients needs to be supplemented. The general principle is that

prescribing and dispensing are kept separate, the dispensing being done by pharmacists who have entered into agreements and placed their name on the panel of pharmacists. There are three notable exceptions. The practitioner is himself required to supply, and not merely to prescribe, those drugs and appliances which are necessarily or ordinarily administered by a practitioner in person, all drugs and appliances in rural districts where pharmacists are not available, and also in all districts, any drugs, etc., which are required for immediate use when the pharmacists' shops are closed or in an emergency.

It is inevitable in a national system affecting the whole working population that some checks on extravagance in prescribing should be imposed where the doctor incurs no financial responsibility when he writes a prescription. The uninformed criticism which is particularly directed to the provision made under the scheme in this respect is once again answered by the Chairman of the Insurance Acts Committee of the British Medical Association in a published letter of the 1st of December, 1930, which is before me. After referring to a recent letter in the public press as "an entirely misleading and erroneous statement, based on a case of proved extravagance in prescribing", he says, "A panel doctor can, and mostly does, treat his panel patients in the same way as his private patients, and he may, and frequently does, order for them the most expensive remedies known to medicine, the only limit placed upon him being that, if challenged, he can satisfy, not the officers of the Ministry, but his own colleagues, that what he has ordered was reasonably necessary for the treatment of his patients." The machinery under the regulations does provide, as stated in that letter, for the control of extravagance in prescribing by the practitioner's own colleagues. The drugs, etc., must be those which are "requisite for the treatment of the patient", and the cost must not be in excess "of what is reasonably necessary for adequate treatment", but no limits are imposed anywhere as to the cost of any drug which may be supplied or as to the average cost of the drugs supplied free of charge to insured persons, and official rulings have placed beyond doubt that the practitioner himself must be the judge in the first instance of what is necessary for his patients. He may in fact be expected to exercise the same discretion as when providing for his private patients from his own stock of medicines. The terms of the Act itself require that insured persons shall have "proper and sufficient" medicines.

Records of Illness

The keeping of records is one of the conditions of insurance practice which many doctors frankly dislike. The obligation, however, is not a very exacting one, and is actually welcomed by those practitioners—and they are only too few—who realize the value of method and order in their practice. The obligation involves keeping in alphabetical order the cards for each patient. These cards are supplied to the

doctor with the particulars in regard to the insured person already written up, and he is expected as a matter of routine to put a tick in one or more of the three columns, *attendance*, *visit*, and *certificate*, on each occasion when he sees a patient. He is also—and this is the principal purpose of the record—expected to keep *a short clinical note*, but only where in his judgment it is likely to be of service to himself or another doctor for reference on future occasions. The making of the routine entries (the ticks) on the card, if they are made at the time of seeing the patient, does ensure that the doctor has in front of him any past clinical notes. As the card is a continuous record of the patient's medical history, intended to last for the whole of his life, being passed on from doctor to doctor, it is obvious that in later illness these cards should, if properly kept, be a valuable source of information to the doctor. (The record on the card is confidential). The record of attendances, visits and certificates—again, if properly kept—should also be of much value for administration and statistical purposes.

Remuneration

Insurance practitioners are paid by a capitation fee which, after some fluctuations as the result of negotiation and arbitration, has stood at 9*s*. 0*d*. per annum for some years. This amount, multiplied by the total number of persons insured each year, is paid into a central pool and out of this a quarterly distribution is made, based on the numbers on the individual doctor's lists. It is not possible to give illustrations of what a doctor may earn at this rate with any real significance, because the insurance practice may be large or small, according to the extent of the doctor's private practice. It may be stated, however, that an insurance practitioner, single-handed, may accept on his list numbers up to a maximum of 2,500, in addition to carrying on private practice. The capitation fee is supplemented in rural districts by a mileage allowance which varies considerably with the character of the district, and the practitioner is also paid for those drugs and appliances which are supplied by him, as distinct from prescriptions written by him and dispensed by pharmacists.

Central and Local Administration

It is only possible here to give the merest outline of the system of administration. In England and Wales the Minister of Health is responsible to Parliament for the maintenance of a satisfactory medical service for the insured population. The country is divided into areas, one for each county and one for each county borough, and in each area there is set up an Insurance Committee responsible to the Minister for the local administration of medical benefit. This Committee, upon which insured persons have a majority representation of three-fifths, also has representatives of the county or county borough council, of the medical profession, and of pharmacists. The Committee through its staff is responsible for the maintenance of the register of insured

persons and for the payment of the doctors' remuneration, and, in addition, it has the responsibility for dealing with complaints and all questions arising between the insured persons and the doctors in the area. This last important function is exercised by a sub-committee of the Insurance Committee, which is known as the Medical Service Sub-Committee, consisting of an equal number (usually three) representatives of insured persons and medical representatives, with an independent chairman.

The Doctors' Share in the Administration

I have referred in the early part of this article to the increasing share in the administration which has been given to the medical profession. The regulations afford evidence that the Minister, in the exercise of his powers under the Acts, is relying more and more on the co-operation of the members of the medical profession themselves, especially where professional questions or professional conduct are at issue. The general interests of the insurance practitioner are looked after by a panel committee in each area, solely representative of the insurance practitioners themselves. This committee must be consulted when the terms of service for insurance practitioners are altered. It has representation on the Medical Service Sub-Committee which has just been referred to, and is also entrusted with the investigation of alleged extravagant prescribing, and it may act in an advisory capacity to the Insurance Committee on matters (*e.g.*, surgery accommodation) where professional considerations arise. Insurance practitioners act on committees set up by the Minister in connection with the distribution of the available funds for the payment of doctors throughout the country, for special grants in rural areas for mileage, and so on. Further, the Minister has bound himself by regulations to consult a purely medical advisory committee where negligence, as defined in the regulations, has been alleged against a doctor and the report is before the Minister for consideration. Negligence so defined includes:

> Failure to exercise reasonable skill and care in the treatment of a patient.
> Failure to visit or treat a patient when necessary.
> Failure to order or supply any necessary medicine or appliances for the use of the patient.
> Failure to advise the patient as to the steps which should be taken to obtain treatment which is not within the scope of a doctor's terms of service.

I believe that the share accorded to the medical profession in the administration is unique. Comparing the English system with all the other Continental systems the difference is very marked and that is doubtless the reason why, compared with the Continental system, the doctors here are comparatively satisfied and in my opinion give a better service.

Complaints against Panel Doctors

It will be appreciated that the functions of the Medical Service Sub-Committee, already referred to, bear a most important relation to the insurance medical service in each area. Complaints against panel doctors may be made by insured persons, or persons authorized to act on their behalf, or, where irregularities in certification are in question, by Approved Societies. Cases may also be referred to the Medical Service Sub-Committee by the Insurance Committee for investigation, but it is not within the function of the Sub-Committee to make investigations of a general character.

There are reasonable time limits within which complaints must ordinarily be lodged. Hearings are private and, although legal representation is not permitted, the prescribed procedure for the hearings is of a judicial character. The Medical Service Sub-Committee report the result of their investigation, setting out the facts and inferences of fact, and making a recommendation to the Insurance Committee. If a breach of the regulations is established, the doctor may be cautioned or censured and may be called upon to refund expenses reasonably and necessarily incurred by the insured person, such as payments made to another doctor for his services. A recommendation may also be made to the Minister that a part of the doctor's remuneration should be withheld, and this is quite commonly done, the amounts withheld varying in general from £5 to £20, though smaller or substantially larger sums are occasionally withheld. In the main the cases investigated fall within the following categories:

(*a*) Charging fees to insured persons.
(*b*) Failure to visit patients or other forms of negligence.
(*c*) Irregularities in certification.
(*d*) Failure to keep records.

Findings of fact by the Medical Service Sub-Committee are final. There is a right of appeal to the Minister from the Insurance Committee's recommendation.

My experience as Chairman of the Medical Service Sub-Committee for London leads me to say that those who sit on this tribunal, whether representing insured persons or medical practitioners, are concerned for the good name of the insurance medical service and for the fair treatment of the insured, while always remembering to see that the doctor gets a "square deal".

Removal from the Panel

The disciplinary action taken in the course of the general administration must be sharply distinguished from the more serious question of the removal of a doctor from the panel. It may be noted in this connection that the Minister, although responsible for the spending of public money on the administration of medical benefit, has not the power of selecting the persons by whom the work is to be carried out, every qualified doctor having the right to go on the panel. On the

other hand, no doctor can be removed except after the prescribed Inquiry. The Committee of Inquiry which has to be set up consists of a barrister-at-law or a solicitor in actual practice and two medical practitioners. The procedure throughout is judicial, counsel are frequently employed on both sides, and the final decision rests with the Minister after considering the report of the Inquiry Committee, and taking the opinion of the Medical Advisory Committee, to which reference has already been made. The cases where practitioners are so removed are few in number and are usually found to involve grave or persistent failure to provide proper treatment, or personal misconduct of such a character as to bring the service into disrepute.

SOME GENERAL REFLECTIONS

Although I have tried to confine myself to those matters which are of real interest to the medical profession and have omitted many details essential to a proper understanding of the Insurance Medical Service, I have left quite inadequate space for comment on the working of the system, the developments which are needed, and consideration of at least one possible alternative.

The Acceptance of the Act by the Profession

It may be that my long and close association with the service actually results in my critical faculties becoming dulled or even inoperative. So far, however, as my judgment goes, the present system—which appears to be as much in the way of public service as the medical profession are prepared to accept, unless they can have the control more largely in their hands—has appeared to meet all the reasonable requirements of the profession. The large share which, as we have seen, they have in the administration, the complete freedom from interference where the exercise of professional judgment is involved, the right of the patient to choose his own doctor, and that of the doctor within wide limits to reject patients that he does not want, the simple and straightforward character of the requirements in regard to the certification and records,—all combine to make the service as satisfactory to those engaged in it as can be expected, when proper allowance for human nature is made. This has been frankly placed on record on many occasions by the Insurance Acts Committee of the British Medical Association, though, of course, from time to time they reserve for continued criticism many matters of detail. It seems equally true that criticism of the service from those medical men not engaged in it is now confined to very few and occasional critics whose observations, often ill-informed and twisted out of any real resemblance to the facts as they are, make it difficult to treat them seriously.

Criticism from the Insured and Employers

The criticism of the service from the point of view of the insured population and also their employers, who watch the working of the

panel system with a good deal of interest, is rather on a different footing. It is impossible not to recognize that even to-day, after twenty years of the working of the new scheme, there is a good deal of disgruntlement with the service which is rendered by panel doctors. Only a fraction of it emerges in the shape of formal complaints, and I am disposed to think that it is probably more existent in areas where the panel work forms only a relatively small part of the general practitioner's practice than in those large industrial areas where the panel work is heavy and practically every doctor in the area is engaged in it. With regard to this disgruntled opinion, two possible explanations occur to one. The first is that where a doctor is treating for an insurance premium patients for whom he formerly received—often from the employer—fairly substantial fees, he has not yet got over a certain amount of resentment or a feeling that he has not been fairly treated; this observation applies to a steadily diminishing group, as the younger men who have grown up with the capitation system may be expected not to have this feeling. The second is that insured persons or their employers are sometimes unduly exacting and are inclined to *require* with some impatience that a doctor should do this thing or that, where formerly, when there was no pre-existing contractual relationship, there would be rather an *invitation* to see a patient and a ready recognition that the hard-worked doctor had plenty of other calls on his time. This merely amounts to saying that there are two sides to the question and it will, therefore, entirely fail to satisfy either those persons who say that you can expect no good from a "panel doctor", or those doctors who are very angry with insured persons who are always insisting on their "rights".

Developments Needed

From the outset the Insurance Medical Service has suffered from the lack of those aids to a general practitioner service which ought to form part of any national scheme for providing medical treatment. The need for laboratory facilities, providing centres for team work, for consultation between medical men, for second opinions, and for specialist services has time and again been insisted upon; the doctors themselves have been as insistent for these improvements as anybody. These things became practicable of attainment when the Royal Commission reported in 1926 and pointed out not only the ways of, but the means existing for providing them, but a certain lukewarmness on the part of some of those Approved Societies into whose surplus funds a considerable hole would have been made commenced the process of failing vitality, which the new proposals began to evince almost before they were born, and the cold clutch of Economy did the rest. This was a great pity, as the panel doctor must continue to do his work with, in effect, one hand tied behind his back. Ophthalmic and dental benefits are provided as extras by some Approved Societies which have sufficient profits on valuation, but these merely take the

form of money grants towards these services; nothing in the form of a fully-organized national service exists in these respects.

The Problem of Service to Dependants

The extension of the whole medical service to the dependants of insured persons has often been urged, but, apart from other considerations, this would be far too costly a business for there to be any chance of its realization in the present state of the public finances, or for long years to come. It is too often overlooked by enthusiasts for such an extension of the service that, whereas there are sound reasons why, in the case of the insured person, the employer should contribute towards the well-being and efficiency of the workmen, there is no good argument for taxing the employer for a medical service for the dependants of the insured person, except the rather remote one that the children are prospective workers. The case for any contribution from the state towards the medical treatment of the dependants also appears to be a very thin one, but here one would be touching on political considerations which have no place in this article.

An Alternative—Salaried or Selected Service

As an alternative to the panel system, the case for a salaried or selected service is, I am convinced, much stronger than general practitioners as a rule are prepared to admit. For some reason or other they will have none of it. It is, of course, absurd to attempt to argue the case in a paragraph or two, but I would like to indulge in one or two reflections upon some of the objections which are urged, often with heat, to the establishment of such a service.

First, as an old civil servant, I will not admit for a moment that a salaried man with a secured appointment is incapable of giving of his best. Civil servants know how to work for the honour of the service, and incidentally, they are not in the habit of making a song about it. I cannot think that medical men are made of a different clay. The fact that any and every qualified medical practitioner is entitled to enter the present service, with no right of selection vested in the Minister, is a distinct weakness from which a salaried service would not suffer. The share of the medical profession in the administration of such a selected service would inevitably be stronger, and not weaker, than under the panel system. One cannot imagine the large body of practitioners engaged in such a service having to answer the complaints which arise in the course of their day-to-day work before a committee. These matters would be disposed of in most cases by a discussion with a senior colleague. Such a service would be able within the funds already available to provide for those things to which I have referred as at present lacking in the panel system. The posts of consultant and specialist, and administrative duties, would provide opportunities for advancement of the best men within the scheme. If we turn to such considerations as the question of free

choice of doctor, it would be honest to admit that a good deal of nonsense is talked about this question, and that the patient's choice of doctor is settled in a large majority of cases by juxtaposition or a neighbour's advice, and even (though, one hopes, rarely) by a knowledge of where facile certification can be obtained. In any case, the really sound elements of free choice of doctor could no doubt be conserved in a salaried or more closely organized system. If it be objected that a service which was confined to the working class or poorer class of the population would not attract the best men in the profession—a contention which is at least open to doubt—it is possible that even this difficulty might be surmounted by allowing private practice; indeed, in many districts this would be inevitable, especially in rural areas. I realize that this is a thorny subject upon which such scrappy comments seem hardly worth while, except as a pointer to the necessity of a much fuller and unprejudiced consideration of the favourable factors than, it is feared, medical practitioners have been prepared to give to the case in the past.

Relationship to Preventive Medicine

I will conclude an article which has already reached undue length by two broad reflections,—the first that the Insurance Medical Service, under an Act designed, according to its title, to provide for the "prevention and cure of sickness", can be said to be preventive only in so far as it ensures that a doctor is consulted in the early stages of illness; or in the wider sense, real preventive effort became largely unattainable when it was decided to create *ad hoc* bodies for the administration of medical benefit divorced from the existing local authorities. This will some day be remedied and the insurance committees will become merged in new committees of the county and county borough councils. A real liaison between the preventive work of the local authority and the Insurance Medical Service can then be established.

Secondly, and this is the last word, *notwithstanding all its defects and its missed opportunities, the service represents for the members of the medical profession an enormous gain on the conditions obtaining before 1911, for the reason, if for no other, that, in the treatment of the employed population of this country every general practitioner is completely freed from any financial anxiety, while the exercise of his clinical judgment, and generally the intimate relations of doctor and patient, remain completely undisturbed. It is equally true that the employed population have secured in this great organized service an enormous boon, and have received, and are receiving in increasing measure, the services of the general practitioners of this country for a trifling annual payment, under conditions which secure to the patients the advantages, without some of the drawbacks, of private medical practice.*

The Simple Facts About Sewage Treatment*

GEORGE G. NASMITH, C.M.G., D.Sc., D.P.H.†

SEWAGE treatment does not sound like a particularly interesting subject. Personally, I would rather write about books and music and flowers and people than of sewage, which always makes me think of the lines in Shakespeare, "Let's talk of graves and worms and epitaphs." But sewage treatment has its place, somebody must deal with the problem and obviously that somebody is the health officer, the city engineer and the consultant.

A complete sewage treatment plant and the operations that take place in the various parts of the plant are exceedingly interesting and the processes involved quite complicated. In a plant designed to turn out a clear effluent and an inoffensive sludge as the two final products, the different operations, though seemingly simple enough, are in reality so dependent upon one another that failure in one part of the process is usually reflected quickly on the efficiency of the other parts.

Perhaps it is not necessary to go into detail as to what sewage is, yet, on the character of the sewage will certain details of the sewage treatment plant construction depend. No two sewages are alike, even two domestic sewages from communities apparently similar in area, population and appearance. For example, the district of North Toronto, a residential district with no manufactures and a population of about 56,000, has a normal domestic combined sewage. York Township not two miles distant from North Toronto, is also a residential district, with no manufactures and a population of about 60,000. Yet the normal dry weather flow of sewage at the North Toronto sewage treatment plant is just over four million gallons a day, while the normal dry weather flow of sewage at the York township sewage plant is just over two million gallons a day or half that of North Toronto. If the engineer who had visited one of these plants had been called upon to design a plant for the other municipality it would have been tempting to assume that the sewage volume would be the same in one case as the other. But if he had made that assumption without further inquiry he would have designed his treatment plant either twice as large as, or only half the size it should have been. Not infrequently a deputation investigates a number of sewage treatment plants and favorably recommends a system treating the sewage of a town or city of about the same size as the municipality interested; yet it might prove and has proved

*The first of two articles on Public Health Engineering which Dr. Nasmith has prepared at the request of the Editorial Board.

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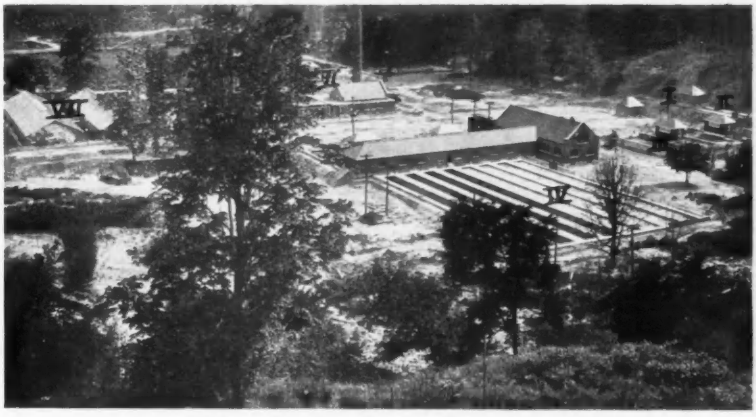
to be a great mistake to assume that a plant similar in design to the one recommended would work as well elsewhere.

Notwithstanding the variations in volume, the total quantity of sewage solids per head of population coming to both the above-mentioned plants would be much the same. In other words, population is one of the basic factors to be considered in the design of a sewage treatment plant. The consulting engineer when called upon to design a sewage treatment plant takes into consideration the volume of water used, the population, the volume of sewage likely to be obtained, the number of houses connected to the sewerage system, whether the sewage is sanitary or combined, and many other factors as fundamental considerations in the design of the plant.

A COMPLETE SEWAGE TREATMENT PLANT

In dealing with the actual operations that are involved in the various stages of sewage treatment, I do not know that I could do better than to take a complete plant like that of North Toronto and explain step by step what each part of the plant is expected to accomplish. Few, if any, plants in the world have as many modern features included as are to be found in the North Toronto sewage treatment plant, located in the Don Valley near Leaside.



NORTH TORONTO SEWAGE TREATMENT PLANT
I Gate house; II Grit tanks; III Preliminary sedimentation tanks; IV Aeration tanks; V Secondary sedimentation tanks; VI Sludge digestion tanks; VII Sludge drying beds.

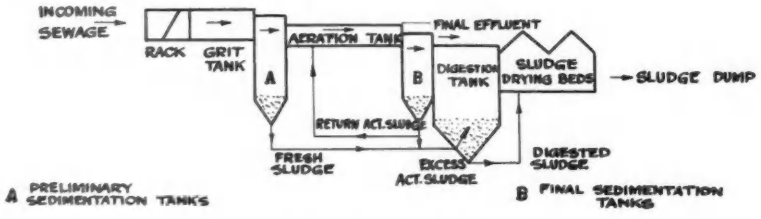
Grit Chambers and Screens

There the combined sewage from 56,000 people is carried through a nine-foot trunk sewer to the drop shaft through which it falls to the inlet to the treatment plant. In the gatehouse a valve controlling the flow is set at the rate of say seven million gallons per day, so that should a larger quantity of sewage than this come to the plant, as during

a storm, the excess will be diverted through a large storm tank in which heavy solids settle out before the sewage flows to the river. It may be said here that the material which settles in the storm tank is removed later on and properly disposed of.

In the gatehouse at the entrance to the plant is a rack consisting of a set of heavy iron bars distributed across the sewage flow so that all sewage entering the plant has to pass through them. These bars catch and hold back large objects like boards, bricks and other coarse materials which would otherwise pass into the plant and damage pumps or other mechanical devices. Any material trapped by these bars is removed by hand rakes, though frequently mechanically cleaned bar racks are employed.

Beyond this rack are two open, long, narrow grit channels through which the sewage flows at such a rate as will allow heavy solids like sand and gravel to settle to the bottom without permitting the lighter organic solids to do so. These grit channels may be operated together or singly, according to the rate of flow, and are cleaned out regularly by shutting one of them off, draining it down and removing the deposited material by manual labor. This material is carried away in small power-drawn dump cars to the dump, spread out in thin layers, covered with lime and hay and allowed to dry. Several cubic feet of grit are removed each day from each million gallons of sewage.



DIAGRAMMATIC SECTION OF NORTH TORONTO SEWAGE TREATMENT PLANT

Instead of grit chambers the sewage may be passed through a detritor in which the same kind of solids will settle but with the advantage that the solids are continuously removed by mechanical means and washed at the same time. The grit so removed from a detritor contains much less organic matter than the grit from ordinary grit chambers and, as a rule, may be wasted anywhere on the surface of the ground without further treatment.

Primary Settling Tanks

After passing through the grit chambers the sewage passes into two primary settling tanks in which the flow is reduced so that one and one half hours are required for its passage from the inlet to the outlet. During that settling period, the heavier organic suspended solids, up

to 60 per cent of those capable of settling, subside to the bottom of the tanks to form fresh primary sludge. On the bottom of each of these settling tanks is a huge scraper driven by electric power which slowly revolves and gradually plows the settled sludge to a sump in the centre of the tank from which it flows through a pipe to a sludge well.

In an ordinary domestic sewage like that of North Toronto, which contains 170 parts per million of suspended solids, there are 1,700 lbs. of solids per million gallons of sewage or 6,800 lbs. in the average daily dry weather flow of four million gallons. Of this quantity roughly one-half, or 3,400 lbs., of these suspended solids would be removed in the primary settling tanks in the form of wet sludge. If this sludge contained 5 per cent of solids there would be 6,800 gallons of primary sludge produced a day.

Aeration tanks

The effluent from the primary settling tanks, containing 50 per cent of the suspended solids and all of the solids in solution, passes into a series of elongated aeration tanks at the entrance to which the sewage is mixed with a proportion of "activated sludge." In these tanks it is agitated with finely divided air bubbles, blown into it from rows of aeration plates, placed along the bottom of the tanks on one side of each channel. As the sewage in its slow four-hour passage through these tanks is aerated, the rising masses of air bubbles give the sewage a spiral motion so that it rolls over and over. The millions of sponge-like particles of "activated" sludge which are continuously being mixed with the incoming sewage at the entrance to the aeration tanks are brought into intimate contact with every drop of sewage, so that suspended particles, bacteria and colloidal material are swept out of the liquid and become attached to and part of the particles of activated sludge. At the same time this activated sludge is able to oxidize or burn up some of the organic material in the sewage to form nitrates and other stable salts. If a sample of this aerated sewage after it leaves the aeration tanks be taken and left standing in a glass cylinder the particles of activated sludge slowly begin to settle to the bottom, leaving a clear water layer on top, all turbidity and color having been removed.

Final Settling Tanks

This aerated sewage now passes into large final settling tanks through which it flows slowly, allowing the suspended particles of activated sludge to subside to the bottom to form sludge containing from 1 per cent to 2 per cent of solids. The clear settled liquid, containing only 15 to 20 parts per million of suspended matter passes over the final weirs to the river. This effluent is no longer putrescible, and in fact is of better quality than the Don river into which it flows. Scrapers in the bottom of these final tanks, similar in character to those in the primary settling tanks, continuously bring the settled activated

sludge to the sump in the centre of the tanks from which it is removed more or less continuously. As would be expected, the volume of activated sludge pumped into the sewage entering the aeration tanks has now greatly increased because of the inclusion in it of most of the remaining 3,400 lbs. of solids coming from the primary tanks in the sewage. It is not necessary to send all of this activated sludge back to the mixing channel or it would accumulate and overload the aeration tanks. Consequently, only a proportion of the activated sludge is returned to the mixing channel and the excess is sent to the same sludge chamber into which the primary sludge was discharged. If 3,400 lbs. of solids were removed daily, this would mean the discharge of 17,000 gallons of excess activated sludge to the sludge tanks. We have now removed all the solids from the sewage in the form of two kinds of sludge, primary and activated, and have also discharged all the clear liquids into the river. There remains only the combined sludge to be disposed of.

Sludge Digestion Tanks

The combined waste sludge flows through a heater where the sludge is heated before it passes into one or other of four large, covered, circular digestion tanks. In these tanks, in absence of air, the warm sludge undergoes decomposition, ordinarily called digestion, during which the sludge is converted into gas and a humus-like material. The gas given off will burn and amounts to over 30,000 cubic feet a day. This gas is used to heat the incoming sludge and for laboratory purposes. The digested sludge contains about 50 per cent organic material which will no longer give off odours and may be wasted anywhere around the plant. It is a valuable fertilizer, containing about 3 per cent of nitrogen as well as other plant foods immediately available for plant growth. At the North Toronto plant the digested sludge is being used as a fertilizer while the grounds around the plant are being landscaped. Later this sludge will be available for market gardeners and farmers. The digestion process is complete in a month and is continuous in that fresh sludge is added to the digestion tanks daily while digested sludge is drawn off to glass-covered sand-drying beds where it quickly drains and dries in a few days.

This brief outline gives a rough idea of the component parts of a complete sewage treatment plant and what each part is capable of accomplishing. Bar racks remove large objects and very coarse material. Grit chambers remove grit. Primary tanks remove from 50-60 per cent of the settleable solids. Aeration and final settling tanks remove the remainder of the suspended solids. The sludges are heated and digested in closed digestion tanks to an inert material, resembling leaf mould, and the digested sludge is dried on glass-covered drying beds. The storm tanks remove a proportion of the settling solids from the storm overflow which would not otherwise be treated. All of the oper-

ations are carried on without the production of odour, and the final products, a clear effluent and a digested sludge, can be readily disposed of and are no longer capable of decomposing.

FACTORS TO BE CONSIDERED IN PLANT DESIGN

It may not be necessary in all cases to treat sewage as completely as in the North Toronto plant and the process may be, and often is, stopped at the end of one or other of the operations outlined above, depending upon the degree of treatment required. Under certain conditions where the safety of a water supply is involved complete purification may be necessary. At the other extreme there may be cities or towns so situated that their sewage can be diluted with huge volumes of water like the sea or in large lakes or rivers, in which case it is only necessary to remove coarse, floating material in order to prevent such material from being deposited on the shores. In between these two extremes there may be situations where it is necessary to remove larger proportions of the organic material in the sewage, the rest of the purification being provided for by dilution with great quantities of water and by the natural processes which occur therein. After all in any sewage treatment plant man has only harnessed and condensed the purification processes which take place naturally when sewage is diluted with water and exposed to the processes of sedimentation, decomposition, oxidation and sunlight. It is evident, therefore, that fine screens only may be necessary in one case; grit chambers and primary settling tanks with or without digestion in another; grit chambers and aeration in another, or all of these where complete treatment is necessary.

There are various combinations of these operations in the eight sewage treatment plants in and around Toronto. At the Scarboro sewage treatment plant there is a detritor, activated sludge tanks and glass-covered drying beds. At one of the East York plants there are grit chambers, activated sludge tanks and digestion tanks. At the main sewage treatment plant for Toronto there are primary sedimentation tanks and sludge digestion lagoons. At the York Township plant there are storm-water settling tanks, grit chambers, activated sludge tanks and sludge dewatering filters, so that everything but fine screens may be seen in this area.

PROBLEM OF SLUDGE DISPOSAL

With the activated sludge process which has become so popular in recent years it is a comparatively simple matter to produce a clarified effluent. Disposing of sludge is not a simple matter, however, as undigested sludge does not dry readily, and, if deposited in thick layers, will decompose before it dries and cause a nuisance in the neighbourhood. The greater the quantity of fresh sludge to be disposed of by drying, the greater will be the nuisance created.

To dispose of the sludge resulting from sewage treatment by digest-

ing it in closed tanks adds a great deal to the cost of treatment, but eliminates the danger of nuisance, and for that reason is being adopted far and wide.

There are a number of other types of sewage treatment tanks and beds which it would take too long to discuss in a paper of this sort. Some of them have almost passed out of existence. Others like the Imhoff tank and trickling filters are in use to-day in scores of municipalities and doing excellent work. But it is improbable that any more Imhoff tanks or trickling filters will be constructed in Canada and consequently the Canadian health officer or engineer is not particularly concerned about them.

The simplicity and compactness of the activated sludge system and controlled, separate sludge digestion tanks, and the improvements being made in these in the effort to lower costs of operation and increase their efficiency is tending to make former methods obsolete. These improvements will probably reduce the cost of air consumption by the substitution of mechanical mixing apparatus for part of the air and the cost of dewatering and drying *digested* sludge.

NECESSITY OF SUPERVISION

It must not be assumed that the operation of a sewage treatment plant is a simple matter or that it can be safely left in the hands of untrained operators. On the contrary the successful operation of a modern sewage treatment plant requires scientific knowledge and skill since there are so many ways in which it is possible for a plant to go wrong and nuisances arise therefrom. In fact, one would say that plants go wrong far oftener as the result of mismanagement rather than from defective design.

In Ontario, the degree of purification required is usually determined by officials of the Department of Health. After that decision has been made data are collected by the consulting engineer as the basis for the design, and when the plant has been constructed it is, or should be, operated by the engineer who designed it for at least six months, in order that the operators may understand what the designer's intentions were, and learn to operate it as the designer expected it to be operated, and not as the more or less inexperienced operator thinks it should be operated.

Immunisation antidiphtérique dans le comté de Témiscouata, P.Q.*

J. C. BEAUDET, M.D., D.P.H.

Officier Médical, Unité Sanitaire de Témiscouata

NE vous semble-t-il pas téméraire que, simple officier médical de l'Est de Québec, je vienne vous dire que chez-nous, dans le comté de Témiscouata, l'on pratique l'immunisation antidiphtérique? Ce fut en janvier 1929, qu'eut lieu, en effet, la première séance du genre. Sur l'invitation de M. le curé au prône, une vingtaine d'enfants attendaient craintifs à l'Ecole de St-Arsène, "leur tour d'être vaccinés" comme ils disaient; un coin, le mieux éclairé de la salle, servait de chambre opératoire; l'une des infirmières enregistrait au "livre d'or" le nom des plus braves, sans en omettre un seul; une autre, au coeur plus maternel, par cajoleries ou par promesses s'évertuait à apaiser les pleurs de certains et une troisième, car il fallait alors tout un personnel, avec le petit coton absorbant imbibé d'alcool, désinfectait la region destinée à recevoir l'injection; le médecin vêtu du sarrau immaculé et respectant dans toute leur rigueur les lois de l'asepsie et de l'antisepsie, piquait dans la région deltoidienne: "Ne bouge pas . . . . ça ne fait pas mal."

Si solennelle que fût cette première injection et si précieux que fût le temps consacré, la médaille offrit tout de même un beau côté, celui d'une propagande fructueuse par toute la région. Mais en présence d'un comté d'une population de 53,000 âmes, avec plus de 20,000 enfants tant d'âge scolaire que d'âge préscolaire, en présence des rigoureuses saisons, des distances considérables à parcourir, une méthode expéditive mais sûre s'imposait et c'est cette méthode que j'appellerai *"l'immunisation à domicile,"* dont il s'agira dans les lignes suivantes:

Dès qu'il est décidé de faire l'immunisation antidiphtérique des enfants d'une paroisse, vite les infirmières, dans la semaine qui précède la première séance, se promènent, je dirai, de maison en maison et spécialement chez les "familles des rangs." Elles apprennent aux mamans que la science médicale possède aujourd'hui un moyen de protéger leurs enfants de la diphtérie; elles insistent pour que les plus jeunes soient vaccinés et qu'ils reçoivent les trois doses: elles démontrent l'innocuité de l'anatoxine, et que le médecin donnera les piqûres gratuitement; elles distribuent le pamphlet traitant de la diphtérie et, en outre, déploient beaucoup de zèle pour faire pénétrer au sein de ces familles les conseils sages que leur indique avant tout leur rôle d'infirmières hygiénistes.

**Travail présenté au Congrès des médecins de langue française de l'Amérique du Nord, Montréal, septembre, 1930.*

Le dimanche, M. le curé à l'église annonce à ses paroissiens, que le soir même, à la salle paroissiale ou à l'école ou même à la sacristie, l'Unité sanitaire donnera gratuitement une séance de projections lumineuses; ces vues ne représentant pas des scènes d'amour, mais prêchant les principes les plus élémentaires, et à la fois les plus méconnus qu'il faut connaître et pratiquer pour avoir une bonne santé, trouvent dans le distingué pasteur un bon avocat; aussi exhorte-t-il ses ouailles à y assister en grand nombre, à y suivre avec attention ce qu'on leur démontrera et à ne pas retourner à leur demeure sans avoir la résolution bien arrêtée de mettre en application au moins un de ces salutaires avertissements. De plus, il leur apprend que, mardi, par exemple, le personnel de l'Unité recevra les enfants qui voudront se faire vacciner, et tout comme pour la visite paroissiale à 9hres. a.m., dit-il, le médecin et l'infirmière seront à l'école du village; à 10.30 hres. chez Aimé Fortin du 7ème. rang; à 11 hres. chez Edmé Latulippe, également du 7ème rang; à 11.30 chez Mme. Vve. Dr. D. Saindon, encore du 7ème. rang, et ainsi de suite pour toute la journée d'un "rang à l'autre." Ne vous faites pas attendre, les médecins ont bien d'autres endroits à parcourir "leur recommande-t-il."

7.30 hres: la représentation est commencée. M. l'inspecteur sanitaire capte l'esprit de l'auditoire plutôt jeune en déroulant devant leurs yeux une pellicule traitant de la diphtérie, son histoire, ses causes, sa contagion et les moyens à la fois préventifs et curatifs, connus et prouvés. Il commente au besoin les passages les plus importants et il est rarement obligé de demander le silence. l'Officier médical assiste généralement à ces conférences cinématographiques et comme intermède, il s'efforce de faire comprendre aux bonnes gens ce que leur coûte ou pourrait leur coûter un tel cas de maladie contagieuse, surtout s'ils sont éloignés du médecin praticien; il n'insiste pas trop sur la mort possible ou sur les complications qui peuvent frapper d'incapacité le malade pour un temps bien long, voire même pour la vie, il leur démontre aussi l'obligation de placarder dans la diphtérie et les invite à profiter des mesures certaines et inoffensives de prévention, qui, si elles causent des réactions rarement générales, mais assez souvent locales, n'offrent quand même aucun danger.

Enfin nous y voilà, c'est mardi. A l'école du village, les enfants sont déjà rendus; l'infirmière les dispose en rangs, relève la manche de leur vêtement, désinfecte à l'alcool leur bras, inscrit les noms du père et de l'enfant et l'âge de ce dernier, et le médecin donne la piqûre. Ainsi, en une heure, l'on en immunise plus d'une centaine. A la campagne, ou mieux dans les rangs, comme on dit, une manière de procéder aussi rapide n'est pas permise car, si en certains endroits on peut grouper les familles, que de fois ne se voit-on pas obligé en d'autres, vu les distances considérables séparant chaque demeure, de faire ces injections de porte en porte.

Permettez-moi quelques chiffres:

Huit paroisses du comté ont déjà été immunisées.

Premières injections d'anatoxine	3292	
Deuxièmes injections "	2807	
Troisièmes injections "	2516	
Total	8615	
Ages:		
Enfants de 6 ms. à 6 ans	1368	1 ères injections
" " "	1021	2èmes injections
" " "	802	3èmes injections
Total	3191	

Aux enfants d'âge scolaire et plus, 5,424 injections furent données.

Réactions:

Enfants au-dessous de 6 ans: réactions générales nulles.
" " " : réactions locales à peu près aucunes.
Enfants d'âge scolaire et plus: réactions locales 19.4%
" " " " : réactions générales bénignes 3.8%
" " " " : réactions générales graves nécessitant l'enfant à prendre le lit 0.073%

Au lecteur qui voudrait savoir si un enfant qui a réagi à une première dose présente également une susceptibilité plus ou moins accentuée lors de la deuxième ou troisième injection, je ne puis donner de chiffres, mes études sur ce point étant encore incomplètes.

On omet, faute de temps, les épreuves de Schick avant et après l'immunisation; les doses sont celles que recommandent les Laboratoires Connaught de Toronto dont on emploie les produits et la désinfection de la peau se fait à l'alcool et celle des seringues et des aiguilles par l'ébullition.

Si, Messieurs, j'ai accepté l'hospitalité généreusement offerte, c'est que l'immunisation antidiphtérique des enfants de tout un comté, pour ne parler que de ce qui me regarde, et quelque mal qu'on en dise, est non seulement possible, mais aisée; de plus, les résultats, il n'y a pas à en douter, se feront bientôt sentir et chez-nous, dans Témiscouata, pas *un seul* cas de diphtérie n'a été rapporté chez ceux qui ont reçu l'anatoxine, ne fût-ce qu'une injection. Et ce qui me surprend encore davantage, c'est que non seulement aucun cas de diphtérie n'a pu être diagnostiqué chez les immunisés mais aussi aucun cas n'a pu être dépisté dans les huit paroisses où le travail fut fait, tandis que dans les paroisses non-vaccinées, l'on constate que pour la période juillet 1929-30, la morbidité de la diphthérie avait été de 38 et la mortalité de 6.

Immunization Against Diphtheria in the County of Témiscouata, P.Q.

J. C. BEAUDET, M.D., D.P.H.

Medical Officer, Health Unit of Têmiscouata

(*Abstract*)

DR. BEAUDET'S thesis is that the vaccination of the children of an entire rural county of the province of Quebec against diphtheria is not only a possibility, but is easy of realization. When it is appreciated that the county of Témiscouata has a population of fifty-three thousand of which twenty thousand are of school and preschool age, that the distances to be travelled are great, and that the seasons are not always clement, one realizes the very great difficulties of the task Dr. Beaudet has set himself. As soon as it has been decided that the children of a parish are to be immunized, nurses make house-to-house visits. Mothers are interviewed, and it is pointed out that medical science offers to-day a means of protection against diphtheria; that this material for vaccination is innocuous, and is given free of charge by the physician, and further, the necessity for three doses is emphasized. Literature is distributed and advice given. On Sunday, the curé announces an illustrated lecture to be held at the church and enjoins his parishioners to heed the advice offered, and, further, indicates where the immunization clinic will be held. The curé, further, invites his congregation to profit by the specific preventive inoculations offered, indicating that some local reactions may be occasioned those, yet no injurious results ensue. More than one hundred children may be injected within an hour's time.

IMMUNIZATION OF PRE-SCHOOL CHILDREN
(Age 6 months to 6 years)
IN 8 PARISHES

1368 received first injection
1021 received second injection
802 received third injection

Pre-School children under treatment,—total 3191.

IMMUNIZATION OF SCHOOL AND OLDER CHILDREN
IN 8 PARISHES

1924 received first injection
1786 received second injection
1714 received third injection

School age and older children under treatment,—total 5424.

Eight parishes have been covered; more than eight hundred preschool children and more than seventeen hundred school children have received three doses of toxoid. In the former group no general reactions whatever were noted and almost no local reactions; in the latter, nineteen per cent local, approximately four per cent mild reactions and severe in less than one tenth of one per cent. No cases of diphtheria have appeared in these eight treated parishes, whereas thirty-eight cases with six deaths have occurred in parishes not yet protected.

Vital Statistics with Particular Reference to New Brunswick

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IN 1887 New Brunswick was given by the Legislature an act for the collection and collocation of vital statistics. Like so many acts, it was left practically to run itself and as a natural consequence ran only into the ground—remaining "static" as it were. A few, relatively very few, certificates were sent in to the Queen's Printer. These in a few years, four or five, became so absurd that even the government became ashamed and ordered publication to cease.

In 1920, through the energy of Mr. E. S. Macphail of the Dominion Bureau of Statistics, a better system was adopted. In New Brunswick we recognized if we were to obtain anything like exclusive reporting it would only be by reducing our registrar areas to the smallest possible dimensions so as to make use of the local knowledge of our registrars. This is the chief, the vital point of our system in this province. We also dropped the payment for individual certificates to such officers and substituted yearly salaries and put the service strictly under the control of the Department of Health, looking to the Chief Officer of this department to keep it in effective motion. These are the three foundation stones of our system which we think has served us well.

Undoubtedly it has its frailties. Most of our registrars began in utter ignorance of the matter, but they improved very rapidly and best of all they early evinced a genuine interest in their work. The salary arrangement appeared and still appears to work well and the provincial administrative power has, curiously enough, not ceased its vigour. Yet much, as hinted, might be said against the system as a theoretical plan. Its success depends entirely upon the good working of the three essentials mentioned. Let one or two break down and it would quickly degenerate into the unspeakable laxity of former times.

Difficulties present themselves with wearisome iteration in connection with all classes of our population. I shall touch upon a very few. First and perhaps chief is prejudice. This is not confined to the ignorant. The very principle of vital statistics is belittled by many of our professions as a "delusion and a snare". While perhaps bushels of wheat or tons of coal or the intricate figures of the stock market are swallowed with the utmost avidity, those of births, marriages and deaths are looked at askance, if looked at at all. Another class professes to hold such figures in disdain as in some way trenching on Providence and actually verging upon infidelity. These classes are

diminishing, though not without influence. A larger class remains and is not greatly subject to diminution. It is the careless, perhaps the most hopeless of all. It includes not only the "ordinary" people—great armies of them—but some of those to whom we look for figures for use. Of this latter, some will forget to sign their names, not always, but once in a while. Others will remain in blissful ignorance of the particulars of a birth or death, and more of the racial origin or occupation. Even the sex is not always distinguished. All of this and much more may be omitted and demands corrective correspondence. But all this, I presume, is a thrice-told tale wherever vital statistics is concerned.

A greater lapse is the total forgetfulness of the registrars to forward their monthly envelope, as we make it a rule that these envelopes are to be delivered with the name and address of the registrar upon the envelope, even in the event of no contained certificates. The negative part of this requirement at first formed an inscrutable mystery to the registrar. The question "Why do you require us to report when there is nothing to send forward?" was not wholly illogical to their straightforward intelligence. It required many letters and philosophy of a sort to make it plain that although no news may be good news, so far as vital statistics was concerned the said homely aphorism was far from applicable.

To know the negative is often as important as to be acquainted with the positive. Eventually this truth has penetrated. Yet, even now, perhaps nearly three per cent forget to forward their envelopes, and these, of course, have to be sent for by means of telegraph, telephone or letter, before the close of the month. Yet, curiously, these recalcitrants are not by any means the same persons. If such were the case they could soon be weeded out as inefficient, but occasionally our most regular and reliable officers fall down from forgetfulness or absent-mindedness.

But the very collection, the actual gathering together of these documents—the raw material, so to speak, outweighs in my opinion all other subsequent manipulations. If such collection be partial, fragmentary and grossly inaccurate, no later manipulation will serve to redeem their usefulness.

The science of vital statistics is capable of yielding highly important information and permits of intelligent deduction, but unless it be founded upon the humdrum of actual contact with the individual to which it refers, it is but a purely artificial thing and becomes, perhaps, beautiful to the mathematician but utterly useless and, indeed, vicious for practical purposes. I cannot but suspect that we have here an inkling of the prejudice of so many to statistics in general, especially of those relating to the human race in its vicissitudes of life. This is due, in a secondary and paradoxical way, to overwrought desire of those in the "upper ranks" of the science for the quality of minutiae

which is called for. It is only a short time ago that our respected Chairman said something to this effect; namely, that any schedule is very liable to vary in inverse proportion in real usefulness to the amount of information crowded upon it. In this, within limits, I am heartily in agreement. Something depends upon the nature and the degree of culture of the population from whom information is sought to be elicited. But no matter how advanced the country, the modern tendency is to ask for an over-abundance.

Nor is this altogether the fault of the "expert". It is very often demanded by persons of intelligence who have little or no practical knowledge of vital statistics proper or of the nature of the information rationally obtainable from it. Instances of this are not far away either in time or place. It is well within the present year that a suggestion reached me that the administration of silver nitrate to the eyes of the new-born baby should be noted on each birth certificate. This is an almost perfect example of our over-enthusiastic friends on behalf of a useful but not overwhelmingly important procedure. If, as may be held, the procedure is of outstanding importance, other means than the birth certificate should be sought for its carrying out. So far as this province is concerned, it is not usual in this office to examine birth certificates until a week or two has elapsed after the birth, that is, it is not very practical to do so. After such a lapse, of course, the instillation in question would have become at least very uncertain in its efficiency. Again, at a still more recent interval we have been invited, almost directed, to obtain a statement of the citizenship of each American who dies in this province. This is still more foreign to the matter under discussion than even the one just adverted to. Again, it is not practical. It would be to convert our sub-deputy registrars into a species of lawyer and to the lawyer and courts, indeed, this question must be referred.

In addition, I beg to lay before you my idea of the use of vital statistics in practice. From time coincident with the commencement of such schedules, their first and chief use was a strictly legal one. When one began to live, and why one died, whether by violence or otherwise, were by the lawyer thought to surpass everything else in importance. Legitimacy and violence perhaps had first place in connection with the service and practice of the matter under discussion. We yet see such lingering prejudice in the matter of coroners regarding the cessation of life. Although strenuous attempts have been made to indoctrinate these officials that it is not their only duty to ascertain whether or not violence has been the cause of the decease, these time-honoured officers still persist in a multitude of instances in directing the jury to return a verdict of "natural causes" if the death be not a violent one. It was some time, I confess, before the real significance of the adjective entered my weary consciousness. "Natural" here means opposed to unnatural, that is, violent cause, and with the

solution of this knotty question, this worthy officer in his pseudo-legal capacity is quite certain that he has done his full duty. Further questioning almost always bring a fairly prompt and usually sufficient mass of information, but it still appears that the coroner thinks the particular case in question is an exceptional one, and usually reverts to the ancient belief when the next case comes before him.

It was not until comparatively modern times, let us say the past three-quarter century, that vital statistics attained a proper place and standing. That standing is indubitably in public health and exists for the practitioners of this latest and perhaps greatest of all sciences more than for any else. An illustration or two will suffice. When an English original medical thinker discovered the modes of transmission of malaria and yellow fever and made possible the control of these diseases, it would, in a relative way, have accounted for but little had not vital statistics shown the accuracy and value of his deductions. Thereafter, it was only necessary for a good administrator, a man always in the second rank to the originator, to clear, say, the canal zone of Panama of malaria and yellow fever and to permit that water-way to be built.

In somewhat like way, Jenner enabled us all to pose as "benefactors of mankind", although very little men, most of all, through vital statistics in connection with smallpox.

These instances, perhaps will indicate my line of thought. Vital statistics, useful to the legal man and still more to him of original medical thought, is essential for those humble practitioners of preventive medicine, and should be, so far as may be, adapted to their use and behalf.

Finally, I recall to your mind that in the present year the standard international death list has been revised. As Mr. Macphail has already presented to you a paper on this subject it will not be necessary for me to take time with it. I will content myself by saying that revision of the standard lists referred to, although absolutely necessary at the end of each ten years, should have as the chief incentive of those engaged upon it, the element of simplicity so far as the latter can be put into practice. A secondary and consequential point is, if possible, not to increase the actual number of causes of deaths now upon the list in question. As about as many names of diseases might be considered obsolete, or referable to other causes as new names of diseases to be added, and so as nearly as possible the list might be preserved from being increased as a result of the revision.

We have in the present schedule, two hundred and five individual causes of death. This, if it can be at all managed, in my simplicity, appears to be sufficient number as a whole.

Sporadic Typhoid Fever Traced to One Carrier

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WITHIN a period of two years twelve sporadic cases of typhoid fever were reported from the environs of a small village in eastern Ontario. As no cases had been reported from this vicinity for many years previously, it was evident that a new source or sources of infection existed. In order to locate this and eliminate further spread, the Department of Health of Ontario, through the Division of Preventable Diseases and the District Officer, investigated the attendant circumstances. Enquiry of the local physicians revealed three more cases diagnosed as typhoid but not reported. A visit was made to each case or family and enquiry made in regard to previous illness, association with known cases, or other cases of sickness, water supply food, meals eaten away from home, travel previous to onset, visitors in the home, sanitary conditions, etc.

Enquiry of the first reported case, No. 2, in table I, with onset in October, 1927, revealed the fact that previous to onset he had been working at the home of farmer X, where his duties were those of general chore boy, including assisting in the nursing of farmer X, who was sick at the time. Case 2 ate his meals in farmer X's home and even ate tit-bits from the tray coming from X. His home was about one-third of a mile from X. His mother, who, like her son was somewhat subnormal mentally, did the washing for X. There was much intercourse between the two homes; the mother often ate at the home of X. The mother, case 3, contracted typhoid fever in November, 1927, and died.

The trail, therefore, led to the home of farmer X. Here was a man, seventy years of age, who did the light work, including milking, on his farm. He had been visiting friends in a distant town for a week, in the latter part of August, 1927. Early in September he became ill, and was confined to bed for three weeks. He was delirious for some time, and, though typhoid was considered, the case was not diagnosed as such. He recovered, and since that time has been in active work on his farm, milking, helping his wife in the house, etc.

The fact that two years later, in October, 1929, B. typhosus was isolated from two fecal specimens taken by us, coupled with the suggestive incubation period, the clinical history of the case and the subsequent history of individuals in association with farmer X developing typhoid fever, leaves no doubt that he had typhoid fever in September, 1927. The infection was, in all probability, contracted during his holiday visit in August. He is case I, in table I.

It was also learned that the wife of farmer X became ill in December, and was in bed three months; the diagnosis made at the time was influenza. Symptoms, as related by the patient two years afterwards, strongly suggest that she suffered from typhoid fever, so that she is considered as case 3, in table I.

A brief résumé of the history of each of the other cases is given below.

Case 4, cheesemaker at cheese factory Y, age 28, contracted typhoid fever in *November, 1927*. He was in the habit of eating curd. Careful investigation did not elicit any other suggestive source. The cheese factory got milk from 134 farmers among whom was farmer X.

Case 6, school girl, age 16, living one-third mile from farmer X, developed typhoid fever in *May, 1928*. One week previously she had eaten supper at the home of farmer X, at which she had water, tea, meat, potatoes, bread, butter and cake.

Case 7, cheesemaker, age 26, at same cheese factory Y; ate curd frequently; developed typhoid fever in *September, 1928*, and died.

Case 8, physician, age 30, developed typhoid in *October, 1928*; had attended case 7, and two weeks before onset his visit to case 7 had coincided with the noonday meal which the physician shared with the family. An interesting feature is that this physician had had typhoid vaccine in previous years; possibly as a consequence his attack was very mild; he returned to practice in two weeks.

Cases 9, 10 and 11,—early in *October, 1928*, two children, living about two miles from farmer X, developed typhoid. Enquiry brought out the fact that the mother had been feeling very "out of sorts" and "exhausted" early in September, from which time she was confined to her bed until late in October. No laboratory work was done and the case was not diagnosed at the time as typhoid. The later history, however, justifies that diagnosis. No known association with earlier cases could be elicited nor any travel or visiting apart from the usual visits to the village on Saturday evenings. There was no ice-cream or other food eaten while in the village. There had not been any visiting at the home. Milk was sent to cheese factory Y, and the cans returned full of whey. The mother had handled the cans and washed them. This was the only possible association with other typhoid fever that could be elicited. The source of infection for the children was, in all probability, the mother.

Case 12, a boy, 14 years of age, developed typhoid fever in *November, 1928*. He was the son of one of the cheesemakers at factory Y. The boy frequently visited the factory and ate freely of curd.

Case 13, man, age 56, developed typhoid fever in *June, 1929*. He lived across the road from farmer X. His daughter, married to farmer X's son, frequently assisted in the household duties at the home of farmer X, and in his home. There was considerable intercourse between the families. The home was supplied with milk from farmer X. The house was well within flying distance of flies. The wife of case 13 had "flu and pneumonia" during the previous winter. Her illness was brief and her recovery complete. Her history did not seem to suggest typhoid fever.

Case 14, cheesemaker at factory Y, father of case 12, contracted typhoid fever in *July, 1929*. Like most cheesemakers, he ate curd very frequently.

Case 15, young man, working and living with farmer X, contracted typhoid fever in *August, 1929*.

Case 16, girl, age 19, sister of case 2, daughter of case 3, contracted typhoid fever the first week in *September, 1929*. She had been employed by farmer X during the second and third weeks of August, eating dinner at his home. She drank milk with each meal, and also drank water from the well.

Case 17, girl, age 18, contracted typhoid fever in *September, 1929*; she lived on the next farm to X, the houses being about 200 yards apart. Case 15 had been a frequent caller at the home. Milk supply was from their own cows and the water from their own well. They

did not send milk to the factory. Their house was within easy flying range for flies from farmer X's buildings. Immediately before onset she had been visiting away from home. Enquiry there failed to elicit any history of probable contact with typhoid fever. Her source of infection was, in all probability, close to her own home.

Case 18, male, age 22; within three weeks of going to hospital suffering from typhoid fever in *September, 1929*, he had gone to cheese factory for the express purpose of getting a "feed of curd." Two boys accompanied him for a similar purpose. There is no history that they developed typhoid. Enquiry failed to elicit any other association with previous cases.

Table I presents the salient points taken from these histories with the cases grouped so as to show more clearly their probable relationship.

TABLE I

SPORADIC CASES OF TYPHOID FEVER TRACED TO CARRIER

No.	Sex	Age	Occupation	Month of onset	Association
Associated with farmer X:					
1	M	70	Farmer.....	Sept., 1927	Visited away from home two weeks before onset; missed case, continued as "carrier," did milking, etc., supplied milk to cheese factory Y.
2	M	21	Labourer.....	Oct., 1927	Assisted in nursing farmer X.
3	F	45	Housewife and laundress.....	Nov., 1927	Did laundry work for X and nursed case 2.
5	F	65	Housewife....	Dec., 1927	Wife of X.
6	F	16	Student.....	May, 1928	Ate at X's within a week or two of onset.
13	M	56	Foreman.....	June, 1929	Milk from X.
15	M	..	Farmhand....	Aug., 1929	Worked and ate at farmer X's.
16	F	19	Farmerette...	Sept., 1929	Worked and ate at farmer X's.
17	F	18	Housewife....	Sept., 1929	Easy range of flies from X's buildings.
Associated with cheese factory Y:					
4	M	28	Cheesemaker..	Nov., 1927	Ate curd frequently at factory Y.
7	M	26	Cheesemaker..	Sept., 1928	Ate curd frequently at factory Y.
8	M	30	Physician.....	Oct., 1928	Attended other cases including case 7; ate at home of case 7.
9	F	36	Housewife....	Sept., 1928	Sent milk to cheese factory Y.
10	F	6	Child.....	Oct., 1928	Children of case 9.
11	M	5	Child.....	Oct., 1928	Children of case 9.
12	M	14	Student.....	Nov., 1928	Ate curd frequently at factory Y.
14	M	35	Cheesemaker..	July, 1929	Ate curd frequently at factory Y; father of case 12.
18	M	22	Canner.....	Sept., 1929	Ate curd 2-3 weeks before onset at factory Y.

It is readily seen that the cases fall into two groups,—first, those associated with farmer X through working with him, eating at his home or drinking milk which he handled; second, those associated with the cheese factory. There are in this group three cheesemakers and the son of the cheesemaker, all of whom ate curd frequently, and the young man who enjoyed the "feed of curd." Possibly associated with the cheese factory is case 9, who was the probable source for cases 10 and 11. This, of course, is problematical as no other known case developed among the 134 producers, all of whom got the whey back in the same manner as did case 9. The probable source of infection in case 8 is evident.

The investigation at the cheese factory itself shows the necessity for more complete supervision. Facilities for employees to wash and to have clean clothing were inadequate. The well water had become "so bad" that they no longer used it, but pumped their water from an intake some 150 feet out in the bay where the water was approximately three feet deep. The floor washings passed through a pipe and emptied some ten to twelve feet from the factory into the edge of the bay from whence the milky trail was plainly to be seen seeping along the muddy bottom for more than one-half the distance out to the intake. Within fifty feet of the corner of the factory, right at the shore line and convenient to the factory and house, stood the privy, the liquids from which entered the bay directly. The privy construction was primitive and gave every facility for access to flies, which could, and did, pass readily through many unscreened openings into the factory to crowd over the vats and the curd therein. Their number was legion, and their activity was great. Samples of curd showed high B. coli counts. The cheesemaker was worried about the "holes" in the cheese. He knew not the gas-forming proclivities of intestinal bacteria.

In operating, the evening's milk is strained from the pails into the factory can on the milk stand, where, on a warm night, the temperature of the milk may not go below 80°F. The morning's milk is added warm and the truck transports it to the factory. Here it is weighed and dumped through straining cloth into a receiving bowl or vat and piped into the cheese vats. The piping cannot be described as sanitary. The milk of one patron—usually carefully selected for quality—is kept out for "starter" for next day's use. The temperature of the milk in the vats is raised by steam in surrounding pipes and, at about 86°F., "starter" is added and the milk is finally held at close to 100°F. to set the curd. When the curd is set and cut, the whey is run off into the tank, from which it is pumped into a separator, to remove the butterfat, which is shipped to a creamery where it is pasteurized before being made into butter. The whey from the separator is pumped into an elevated tank outside in the sun and steam turned into it with the idea of pasteurizing. Needless to say, the attempt at pasteurizing whey in this manner is not exactly successful. If the volume of whey is not

enough to fill all the patron's cans, water is pumped into the tank, so that no partially empty can may be taken back to the farm from which it came that morning full of milk. It is the task of the farm housewife to clean, and, if possible, sterilize the can before it is used again for milk.

It will be noted that from the cow to the cheese the condition of the milk is such that typhoid bacilli introduced from the hands of the milker would find few deterrents and many inducements to multiplication.

The water supply in this community was practically all from individual wells, samples from many of which showed B. coli. The substratum in the whole area is limestone with a varying depth of soil on top. Practically all the wells went down to or into the limestone. The well at the house of farmer X was heavily polluted. It was within 100 feet of the privy which was of primitive type.

Control Measures

The only carrier found, case 1, was ordered to take no part whatever in the production of milk or the handling of milk utensils; utensils were ordered to be cared for at the home of the son, 200 yards away from the father's house. The privy was ordered moved or a new fly-proof, sanitary privy built 200 feet further away from the well. Reorganization, including provision of a proper water supply, properly placed sanitary privy, adequate facilities for washing and cleanliness, complete screening, etc., was ordered at the cheese factory.

Summary

Eighteen sporadic cases of typhoid fever are reported. The source of infection was found to be an undiagnosed case, a farmer, aged seventy, who brought typhoid fever to the community following a visit to relatives some distance away. He has remained a carrier, and has continued to spread the infection. The spread was through direct association with this farmer, eating in his home, etc., through raw milk and through milk in the curd state in the cheese factory. One case possibly arose from cleaning milk cans which held contaminated whey. Two children of this case developed typhoid. One physician contracted the disease probably from contact with cases or from eating in the home of a patient. Of the eighteen cases found on investigation, fifteen had been diagnosed as typhoid and twelve had been reported.

The necessity for more general use of our laboratory services, the danger, to the individual and to the public health, of a missed case of typhoid fever and the necessity for pasteurization of all milk sent to the cheese factory are evident.

The Progress of the Organization of County Health Units in Quebec

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THERE are now organized in the province of Quebec twenty-three county health units covering twenty-nine counties. The first to be opened was Beauce, in 1926, which was followed in the same year by the units of Saint Jean-Iberville and Lac Saint Jean. This experiment proved of such advantage that other units have been formed each successive year: St. Hyacinthe-Rouville in 1927; Témiscouata, Nicolet, Joliette, Terrebonne, in 1928; in 1929, L'Assomption-Montcalm, Chicoutimi, Témiscamingue, Megantic, Kamouraska-L'Islet; and in 1930, Lotbinière, Matane, Lévis, Matapédia, Frontenac, Rimouski, Châteauguay-Laprairie-Napierville, Argenteuil, Bonaventure and Labelle were founded (table I).

The Director of the Provincial Bureau of Health and the Assistant Director, who has immediate charge of the units, early saw the advantages to be gained by the opening of a training school for the purpose of preparing the staff which would be required as new units were created. The Beauce unit was selected, and, in 1929, a training centre was definitely instituted at Beauceville. The importance of this provision is appreciated when it is noted (table II) that the twenty-three units at present organized require a staff of 161 trained persons.

The annual budget of the county health units is generally $12,000 per year, but two units have a slightly higher appropriation.

The population served by the 23 units is 767,062. The unit with the highest population is Chicoutimi with 56,498, and the one with the lowest population is Témiscamingue with 14,920 people. The mean population is 33,133 per unit and 26,278 per county.

If the total population of the province be estimated at 2,735,000, after deducting 1,093,800 for the cities having their own public health organization and the 767,062 people at present served by health units, there remain 874,138 persons (53 per cent) yet to be organized under the system of county health units. *This means that nearly half of the population that may be organized under this system is now provided with health organizations as efficient as may be found in any city.*

This is a remarkable result which has been obtained in less than five years, and, when it is taken into account that during 1930 ten units, including almost one-half of the total population, have been created, it will be appreciated that only a couple of years at the most will be needed to bring the whole province under this system.

TABLE I

COUNTY HEALTH UNITS IN THE PROVINCE OF QUEBEC

Five-year period, 1926-1930

County Health Units	Year of Organization	Number of Counties	Population	Headquarters	Annual Budget
1. Beauce	1926	1	48,082	Beauceville	$12,000 00
(a) Training School	1929			Beauceville	10,000 00
2. St.-Jean-Iberville	1926	2	25,901	St.-Jean	12,000 00
3. Lac St.-Jean	1926	1	48,560	Roberval	12,000 00
4. St.-Hyacinthe-Rouville	1927	2	38,296	St.-Hyacinthe	12,000 00
5. Témiscouata	1928	1	52,070	Riv. du Loup	12,000 00
6. Nicolet	1928	1	30,658	Nicolet	12,000 00
7. Joliette	1928	1	28,663	Joliette	12,000 00
8. Terrebonne	1928	1	37,268	St.-Jerome	14,000 00
9. L'Assomption-Montcalm	1929	2	29,560	L'Assomption	12,000 00
10. Chicoutimi	1929	1	56,498	Chicoutimi	15,000 00
11. Témiscamingue	1929	1	14,920	Ville-Marie	12,000 00
12. Megantic	1929	1	43,987	Thetford Mines	12,000 00
13. Kamouraska-l'Islet	1929	2	44,228	Ste.-Anne	12,000 00
14. Lotbinière	1930	1	24,275	St.-Flavien	12,000 00
15. Matane	1930	1	26,736	Matane	12,000 00
16. Lévis	1930	1	33,165	Lévis	12,000 00
17. Matapédia	1930	1	25,168	Amqui	12,000 00
18. Frontenac	1930	1	25,746	Lac Megantic	12,000 00
19. Rimouski	1930	1	31,473	Rimouski	12,000 00
20. Châteauguay-Laprairie-Napierville	1930	3	35,095	Ste.-Martine	12,000 00
21. Argenteuil	1930	1	16,230	Lachute	12,000 00
22. Bonaventure	1930	1	29,903	New Carlisle	12,000 00
23. Labelle	1930	1	20,580	Mont.-Laurier	12,000 00
Totals		29	767,062		291,000 00

TABLE II

FIELD PERSONNEL CONNECTED WITH COUNTY HEALTH UNITS

Full-time county health officers	24
Full-time district health officers	5
Full-time county health nurses	64
Full-time county sanitary engineers	1
Full-time county sanitary inspectors	24
Part-time county sanitary inspectors	2
Part-time tuberculosis clinicians	6
Full-time tuberculosis clinicians	4
Full-time clerk-secretaries	24
County health officers now attending Schools of Hygiene, Toronto and Baltimore	7
Total	161

Editorials

STERILIZATION AND MENTAL HYGIENE

WITH man's unconquerable tendency to set himself apart from other living things, it is difficult, even for many scientific men, to discuss as dispassionately questions of human eugenics as the problems of selective breeding of vegetables or live stock.

Two facts are obvious at the outset. First, the subject will not down. It is an aspect of evolution itself that the superior minds of the present generation should vision higher levels for those to come. Any programme to this end must necessarily be based upon the observational data of biology. Not only will the subject of eugenics not down; it has had the dubious advantage of becoming popular. The zeal of enthusiasts has promoted too much discussion, strengthened hostile prejudices and retarded progress.

The second equally obvious fact is that the goals so readily attainable in the breeding of certain domestic animals can never be reached with human beings for the simple reason that the domestic animals have no choice in the matter. As society is constituted there is no prospect that through universal application of the principles of eugenics, positive and negative, a race superior to the present human species will inherit the earth.

Despite this view, which is at variance with the proclamations of some of the crusading eugenicists, it is not necessary to adopt a policy of pessimism. Because perfection cannot be achieved, should improvement, however small, not be striven for?

It has become somewhat the mode among those with behaviouristic leanings, to minimize, indeed almost to deny, the significance of heredity as the determiner of what a developing individual may or may not become. This attitude is all the more surprising at the very time when the new science of genetics has been making greatest advances, and when biology has brought us very close to the actual mechanism through which ancestral traits are transmitted, and has defined more sharply than ever before the line of demarcation between that which *nature* must inevitably do and that which *nurture* may possibly do.

"The general tendency of recent work on heredity is unmistakable, whether it concerns man or lower animals. The entire organism, consisting of structures and functions, body and mind, develops out of the germ, and the organization of the germ determines all the possibilities of development of the mind no less than of the body, though the actual realization of any possibility is dependent also upon environmental

stimuli. . . . . psychological characters appear to be inherited in the same way that anatomical and physiological traits are . . . . . and there is no longer any question that some kinds of feeble-mindedness, epilepsy and insanity are inherited." (Conklin).

Preventive medicine comprises the methods of removing pathogenic agents and raising the health standards, physical and mental, of the individual and the race. Sterilization to prevent certain types of feeble-minded individuals from reproducing their kind is one of the means to that end. Tredgold, a traditional opponent of sterilization, in an address before the London Conference on Mental Welfare in December, 1930, gave his impression that not more than five per cent of mental defectives were the offspring of defective parents. Against this startling and undocumented statement may be quoted a careful study of 348 cases of feeble-mindedness from the Ontario Hospital at Orillia. In 33.6 per cent of these cases one or both parents were mentally deficient. That this figure is too low is indicated by the fact that in a further 32.4 per cent data were insufficient to establish etiology. R. A. Fisher estimates that about 11 per cent of the feeble-minded of any generation in the community at large are the offspring of feeble-minded parents.

Tredgold echoes the popular fear that sterilization encourages sex promiscuity. Another commonly expressed fear is that it would increase the incidence of venereal disease. Both of these notions are *a priori* assumptions independent of experience. The records of the Human Betterment Foundation in California indicate that these fears have not been realized in that state where legalized sterilization of certain types of feeble-mindedness and insanity has been widely practised for the past twenty years. "Of a group of mentally deficient girls, 75 per cent had been sex offenders prior to commitment. After sterilization and parole, only 8 per cent were sexually delinquent, and these, being under strict supervision, were more easily controlled. The policy, therefore, results not only in a decrease of promiscuity, but in a corresponding decrease in opportunities for the spread of venereal disease."

Sterilization is not a panacea. It is one of the available means for racial improvement. The science of genetics is in its infancy. With further discoveries (eventually the possibility of identifying normal carriers of defective genes), eugenic procedures will gain correspondingly in effectiveness.

"Even with our present knowledge," says Jennings, "eugenics may enable us to get rid of a certain proportion of such defectives as the feeble-minded . . . . It is an attempt to place ourselves in line with upward evolution, and as such is worthy of interest and active sympathy. . . . . Whether eugenics is to become something more quickly practical than this depends upon whether certain requisite discoveries are made by the science of genetics."

But it would be a mistake to consider such measures as sterilization merely in their eugenic relationship. Insurance against child-bearing by the comparatively simple sterilization operation is for many women distinctly a health measure, and in such cases is to be viewed as any other medical procedure.

In other instances it may recommend itself on economic grounds, for example, that of impoverished parents of an already considerable family, particularly if of inferior stock, who must constantly depend upon charity, and with whom birth control technique is impracticable.

Again, it permits many individuals who might otherwise have to undergo long terms of segregation in an institution to live safely in freedom and be self-supporting, wholly or in part. They may even marry and achieve a satisfactory home life which would be quite impossible except for the guarantee of childlessness.

There are those who anticipate the danger that if sterilization becomes an accepted practice it will lead to abuse in being too widely or too uncritically applied; and it must be said that over-enthusiastic proponents may have afforded grounds for such a fear. The only Canadian province which has passed a sterilization law is Alberta, and this Act lays down strict conditions to ensure that the operation shall be done only in demonstrably suitable cases. It is hardly likely that similar legislation which may be brought forward in other provinces will fail to provide all necessary precautions both to safeguard the proper privileges of individuals and to promote the welfare of society.

C. B. Farrar

THE COMING REGINA MEETING

IT has been the policy of the Association to meet in turn in Eastern, Central and Western Canada. This year the Annual Meeting is to be held in Regina, June 17th, 18th and 19th on the invitation of the Provincial Government, the City of Regina and the Saskatchewan Health Officials' Association.

The Saskatchewan Health Officials' Association, organized six years ago through the enthusiasm of the late Dr. M. M. Seymour, then Commissioner of Health, is to-day one of the most active of the provincially organized health associations in Canada.

The joint committee, in arranging the programme, is providing not only for the holding of Section meetings in vital statistics, public health nursing, laboratory work and public health engineering, but general sessions of special interest to the health officers and officials throughout Canada. It is not too early to make plans to be present.

EPIDEMIOLOGY AND VITAL STATISTICS

DR. A. L. MCKAY, B.A., M.D., D.P.H. AND DR. F. W. JACKSON, M.D., D.P.H.

DIPHTHERIA PREVENTION IN BRANTFORD, ONTARIO

THE remarkable efficiency of diphtheria toxoid in preventing diphtheria in a community is again conclusively shown by the experience of this city during 1930. During the year 815 children received the toxoid treatments at the clinics conducted, by permission of the two Boards of Education, in the schools of the city and in the Health Office. Since we started this work in 1922, a grand total of 9,496 school children have received these preventive treatments. During the year there were only eight cases of diphtheria in the city and four of these came in from other towns and cities. The other four cases were all in children who had not received the toxoid treatments, and one of these unfortunate children died.

It is now the permanent policy of the Department of Health to keep Brantford free from diphtheria, by annually seeking the co-operation of all parents whose young children have not received the toxoid treatments, and by offering these treatments free of charge.

During the year a group of 104 young children were Schick tested following administration of toxoid. Their average age was three years. Ninety-seven children showed a negative Schick test. Seven showed a positive Schick test and were given a further course of toxoid treatments. The co-operation of the parents of these children is gratefully acknowledged.

These results may be compared with those reported by Dr. W. T. Harrison (Public Health Reports, 1930) for an older age group. Four hundred and seventy-five school children who have received the two doses of toxoid were Schick tested and 95 per cent gave a negative reaction (immune).

It is not a practicable procedure to Schick test after treatment every child, as it is necessary to wait six months after the last treatment before doing the test. Nor is it necessary from a community standpoint, since we know that from 90 to 95 per cent of toxoid-treated children are immune to diphtheria. Nevertheless, we are prepared to perform the Schick test for any citizen who requests it.

Annual Report, Brantford Board of Health, 1930.
Dr. W. L. Hutton, Medical Officer of Health.

"HEALTH"

The first issue of the new monthly health bulletin of the Vancouver Department of Health stresses the urgent need of reducing the diphtheria incidence in Vancouver by the use of diphtheria toxoid. The bulletin will well serve its purpose in bringing the work and plans of the health departments to the citizens.

A Criterion for Healthy Mental Development--The Satisfactory Distribution of Interest-Energy

W. T. B. MITCHELL, M.D.,

Director, The Mental Hygiene Institute, Inc., and Assistant Professor of Mental Hygiene, Department of Preventive Medicine, McGill University, Montreal, Canada.

HOW is the individual child building in his mental life that he may successfully face the critical tests which come with adolescence and adult life? Mental disorders do not ordinarily occur in childhood. They do occur in adolescence and adulthood on the basis of mental conflict, which in turn is the result of the inferiority feelings, lack of self-confidence and general feelings of insecurity which accrue to the individual as a result of a sense of failure in his social contacts. Any continuous sense of failure during the developmental period distorts the normal distribution of interest which means healthy mental growth.

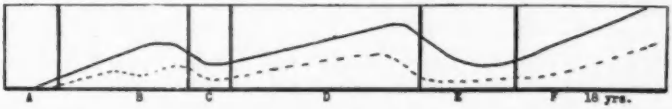
The individual begins his life with his interest pretty completely centered on self. His interest is bound up very definitely with his own feelings and sensations and the immediate satisfaction of his appetites. As he develops there should normally occur a progressive out-turning of this interest and its increasing detachment from self and attachment to outside events, objects and people. In the early transition phase the normal, immediate response to thwarting is a temper outburst. As the child's interest becomes more completely attached outside himself, as the element of satisfaction from these outside relationships increases, as he learns that the rage does not serve as a means to satisfying his desire, he learns to forego immediate satisfaction, that is, he permits the increase of the gap between desire and attainment. In other words, he learns the lesson which is essential to healthy maturing, that is, to postpone the pleasure of the moment for a more distant satisfaction. He is establishing what we refer to as emotional self-control. He is on his way in his development from a primitive to a more highly civilized state.

In the beginning phase of this distribution of interest-energy to the outside it is natural and normal, in the face of disappointment or failure, that the individual will fall back on the easier way of getting satisfaction through such auto-erotic practices as thumb-sucking, thigh-rubbing, masturbation. These practices, appearing in the two or two and a half year old, should again be regarded as

normal transitory accompaniments of this transition period. As the individual progresses the tendency to fall back on self for satisfaction should progressively fade, provided we have not fixed the self-interest through unwise interference.

At any period in the pre-school or elementary school development, through an evaluation of his attitudes and behaviour responses, we should be in a position to say how satisfactory a foundation the child is laying for later mental health. Unless he is on his way to entering the adolescent period with a socially acceptable, personally satisfying diversification of outside interests, the possibilities of healthy mental maturing are seriously endangered. We have in the past over-troublesome, authority-defying behaviour and have seriously under-evaluated aggressive, valuated, submissive, withdrawal responses which are apparently significant obstacles to healthy personality integration.

Transition periods in the individual's physiological or social life are critical periods in his mental life because there is inevitably and normally at such periods a partial withdrawal of interest from the outside and a re-centering on self. The more complete the out-turning process has been, as evidenced by the healthy distribution of interest, by the self-feelings of confidence, adequacy and independence which marks the individual's general social relationships, the less marked and the less serious will be the withdrawal noted at such critical periods as puberty, marriage, childbirth, menopause, etc. On the other hand, for the individual in whom a sense of failure in his social relationships has resulted in an unhealthy investment of his interest, with the mental conflict and discord which accompanies it, these critical periods frequently become the stumbling-blocks which precipitate frank mental breaks. In attempting to measure just how adequate the distribution of interest-energy is, the criterion must be in terms of how socially productive and satisfactory and also of how personally satisfying it is.



——*Curve showing ideal normal distribution of interest-energy in personally satisfying, socially acceptable ways.*

- - - *Curve showing unhealthy distribution of interest-energy where interest remains too closely related to self—marked by such behaviour characteristics as:*

Dependency, sensitiveness, emotional instability, day-dreaming, fearfulness, and later shyness, continuing infantile responses.

Fears, phobias, feelings of inferiority, hypochrondriacal complaints, social isolation, etc.

.....A—Infancy, early self-centered, auto-erotic period.
.....B—Pre-school period.
.....C—Transition period between home and larger social group, represented by school.
.....D—Pre-adolescent period.
.....E—Puberty—later auto-erotic period. Marked by self-consciousness, sensitiveness, ... slump in outside activities and performance, *e.g.*, school performance, and deter- ..... mined largely by physical changes of period.
.....F—Later adolescent years, with redistribution of interest to outside things—social ..... interests, recreational and vocational interests, mating or hetero-sexual interests.

Some factors which prevent normal distribution of interest

1. Over-solicitous attitudes, fear for child, unwillingness to have him take any risks, anticipation of his needs—maintains a crippling dependence and makes it difficult for him to establish later independent interests and satisfactory social relations.
2. Strongly marked emotional attitudes on part of adults, expressed before child or directed to child.
3. Unwise interference with child's auto-erotic or narcissistic behaviour, tending to prolong this self-interest and producing background for later instinctive conflict.
4. Dominant attitudes on part of parents, influencing child's decisions by imposition of adult standards.
5. Disappointment attitudes of parents directed to child.
6. Being displaced suddenly without satisfactory preparation from the centre of family stage by advent of another child.
6. Discrepancies between child's capacities and the tasks with which he is faced—continuing failure resulting in feelings of inferiority and built up during entire developmental period.

Parents, teachers and physicians, if they are to avoid mistakes in their guidance of the mental growth of children, must know what is available regarding the mental needs and characteristics of the individual child in his period of development. We must have our objectives clearly in mind, together with criteria all along the line to determine the degree of success or failure in the attainment of the objectives.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—DECEMBER, 1930

Diseases	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta ‡	British Columbia
Diphtheria....	11	66	43	232	355	49	22		24
Scarlet Fever..	1	54	52	438	612	103	46		87
Measles.....	—	5	6	281	83	91	183		17
Whooping Cough.....	—	15	—	169	338	49	13		280
German Measles....	—	1	—	7	26	†	9		1
Mumps.....	—	22	—	167	448	195	14		123
Smallpox.....	—	—	—	1	4	—	16		6
Cerebrospinal Meningitis..	—	—	—	1	2	2	1		1
Anterior Poliomyelitis	—	—	—	1	9	2	5		1
Typhoid Fever	—	2	15	62	50	6	4		22

*Data furnished by the Dominion Bureau of Statistics, Ottawa.
†Not reportable.
‡Report not received.

PUBLIC HEALTH NURSING

RUBY M. SIMPSON, Reg.N., and FLORENCE H. M. EMORY, Reg.N.

Contribution of Junior Red Cross to Public Health

JEAN E. BROWNE, REG. N.

HOW does Junior Red Cross foster an interest in health in the young? Before answering this question it is necessary to state that it works entirely in the schools. Its great genius consists in offering to the schools a practical programme through which ideals may readily be put into practice, and in supplying a motivating force which inspires children to adopt the programme with satisfaction and enthusiasm.

Three-fold programme—health, service and international friendliness,—it has been so subtly adapted to the school system that it can be worked into practically any modern curriculum without adding an extra burden to the teacher. Furthermore, and this is a most important point, having once introduced its organization into the classroom, the Red Cross judiciously leaves the operation in the hands of the teacher. The teacher is the local director of the organized group, and as long as the main objects of the Junior Red Cross are adhered to, she is allowed unlimited latitude in methods of working it out. Teachers who have given Junior Red Cross a fair trial are in almost one hundred per cent of cases enthusiastic exponents of the movement.

It is, however, to the children themselves, who have become members of the Junior Red Cross, that we must attribute the great success of this world-wide movement with its membership of over 11,000,000. To those who have seen Junior Red Cross in operation, there can be no doubt that children who become members of the organization are profoundly influenced by it,—influenced to purposeful action and habit formation.

Perhaps we can see this more readily in connection with health education than in the other phases of the Junior Red Cross programme. The rules of health, which are regarded by the members of the Junior Red Cross as a kind of creed, are quite simple. They include a nutritious diet, fresh air, sleep, exercise, posture, elimination, cleanliness of teeth, body, hands and fingernails and precautions against the transmission of disease germs by coughing, sneezing and spitting. Any child can easily acquire an academic knowledge of these rules, but it is quite possible for him to have this academic knowledge and yet practise none of the rules. In order, therefore, to secure results, another factor besides knowledge must be introduced. There must be some strong motive operating in the child's own being, so that he may have a strong desire to put his acquired knowledge into practice.

The method which has proved successful in health education and which is the key-note of Junior Red Cross organization, is to give the child an opportunity to take responsibility and to participate in our plans for his health and the health of others. This method can be worked out through a club which is voluntary and self-governing and through which it becomes the fashion, so to speak, to be scrupulously careful about keeping the rules of health. Through this means the member's adherence to the ideals of his club is judged by his fellow members. I believe it is accepted as a maxim by educationists that there are few satisfactions so gratifying and few annoyances so distressing as the approval or disapproval of one's comrades, and it is because of this that the work of the self-governing club is so effective.

If, through the same club, we can link up with the health work an activity which stimulates the altruistic emotions of the child and also opens up a practical channel through which the child's feelings of compassion may find expression and satisfaction, then we have indeed found a strong motive which will grow deeper and stronger as the child develops.

And if, in addition to this, the child belongs to a club which is not only local but also national and international, there comes that enormous, indefinable force we know as "*esprit de corps*," a pride in belonging. When children thrill with pride in their organization, there is practically no limit to the results which can be obtained through harnessing this emotion. I make this statement not merely as a theory, but something which I have seen in operation in literally thousands of classrooms organized in Junior Red Cross in my own and other countries.

It is significant that public health nurses regard Junior Red Cross as their strongest ally. In Sydney, Nova Scotia, where Junior Red Cross is organized in every classroom in every school in the city, the school nurse, through whose efforts this has been done, says that she couldn't possibly manage her large school population without the help of the Juniors. In fact, in almost every part of Canada, public health nurses are encouraging in every possible way the organization of the Junior Red Cross, because those who have seen it in operation realize that it stands the acid test,—it is securing results in the practice of health habits.

NATIONAL VOLUNTARY HEALTH AGENCIES

ETHEL GREENWOOD, REG.N.

MARIONETTES ENLIST IN THE VICTORIAN ORDER

"Not a bad achievement for a tiny person not more than fourteen inches high. A midget? No, she is not a midget. She is a little puppet in the remarkable marionette show which was an exceedingly popular feature of the Victorian Order of Nurses' exhibit in the Health Wing of the Ontario Government Building. As a visiting nurse she plays the

leading role in a little three scene drama which shows the scope of the work of the Victorian Order of Nurses in a most fascinating and realistic way."

Thus the Toronto *Globe* commenced its graphic description of the Victorian Order's exhibit at the last Canadian National Exhibition. That the nurse and Mrs. Martin, the patient, and the Irish neighbour, Mrs. O'Brien, were popular with the throngs who milled through the Ontario Government Building throughout those two weeks, cannot be disputed.

Scene 1 of the little playlet shows the Victorian Order nurse in her office. The telephone rings frequently and conveys an idea of the type of calls coming into a single nurse district. In *Scene 2* the nurse is walking along the street looking for a number. Several children playing on the street engage the nurse in conversation. She is an old friend of theirs, and is thus able to "get across" some health teaching. *Scene 3* shows the interior of the patient's house. It is a bedroom scene, with the mother in bed and Mrs. O'Brien, a neighbour, on hand to help with the housework and to dispute the "new fangled ideas."

Books and Reports

D. T. FRASER, B.A., M.B., D.P.H.; R. R. MCCLENAHAN, B.A., M.B., D.P.H.

Bacteria Applied to Nursing— *By Jean Broadhurst, Ph.D., Professor Bacteriology, Teachers College, Columbia University, and Leila I. Given, R.N., M.S., Instructor of Bacteriology, School of Nursing, Western Reserve University. Publishers, J. B. Lippincott Company, 201 Unity Bldg., Montreal, 1930. 498 pages. Price $3.50.*

The authors fully realize the difficulties inherent in any attempt to present the subject of bacteriology to nurses. At the same time they appreciate the necessity of providing a course of study which will not only meet the individual needs of the nurse, but which will, also, serve as a basis of knowledge for the interpretation of bacteriological principles and the sane and intelligent application of them in her work. The plan of the book is admirably designed to achieve these purposes. Thus, the first three chapters are devoted to the microscope, a knowledge of cells and a general appreciation of the relation of living things to man. The following four chapters deal with moulds, bacteria and protozoa, what they are and how their activities may be controlled. The role of bacteria in relation to air, soil, water and food is next considered, followed by three chapters dealing with the relationship of micro-organisms to disease and including natural, artificially induced immunity. Finally, consideration is given to tests such as Schick and Dick tests, the Wassermann, along with directions for media and staining technique. The book is very profusely illustrated. Excellent laboratory suggestions follow each chapter.

One appreciates in such an arrange-

ment of subject matter that the authors have a very definite purpose in mind of presenting a book which should impart a knowledge on the subject of microbiology, but which, at the same time, should serve as a training in the so-called scientific method. This is, of course, a formidable task when only some sixty hours are allotted for the study of bacteriology.

The text has been very carefully prepared. The method of emphasizing certain words or phrases by printing them in heavy type detracts very much from the appearance of the book. One cannot help feeling that perhaps the student will be encouraged to accept the emphasis for more than it is worth. Thus in the statement, "We see, therefore, that we are dependent upon green plants for the food we eat and the air we breathe," there are no less than ten words in heavy type. "Shick" unfortunately has crept in once, on page xv; "vitamine" is more correctly "vitamin"; figures 274 and 275 are not satisfactory; the section on tuberculin test needs revision. The question of diagrams in illustration of the Wassermann test, lysins and other reactions is a matter of individual preference, and though ample warnings are given by the authors against accepting them in any literal sense, such diagrams are not very satisfactory.

For those who require a text book and laboratory guide on bacteriology for nurses there is none better than that of Broadhurst and Given.

D. T. F.

Epidemiology Old and New—*By Sir William Hamer. The Anglo-French Library of Medicine and Biological Science. Publishers, Kegan, Paul, Trench, Trubner and Company, Ltd., London, 1928. The Macmillan Company of Canada, Toronto, Canadian agents, 180 pp. Price $2.75.*

Sir William Hamer sets himself the task of "taking stock of the modern setting of epidemics and comparing them with Sydenham's constitutions." Sydenham's great and fundamental contribution to epidemiology was that there are gradations, modifications and affinities among epidemic occurrences in successive cycles of years. Sir William Hamer's effort to make a comparison between the behaviour of epidemics as seen in and from London during the last forty years with the corresponding happenings in Sydenham's time has been most profitable and stimulating, and this volume is of real interest to all students of epidemiology.

R. D. D.

Symposium of Cancer — Being the January, 1931, Issue of Annals of Surgery—*Edited by Lewis Stephen Pilcher, M.D., LL.D., in conjunction with Frank E. Adair, M.D. Publishers, J. B. Lippincott Company, 201 Unity Bldg., Montreal, 480 pp. Annual subscription, including this volume, $10.50.*

The immediate occasion for the publication of this special cancer number was the honouring of Dr. James Ewing, whose sixty-fourth birthday occurred on December 24th, 1930. Fifty-four articles are contributed by the leading American and foreign authorities on cancer in all its varied aspects, constituting a suitable tribute to one who is acknowledged as "the

foremost American investigator of the entire group of neoplastic diseases." The volume is a significant and valuable contribution to the literature of cancer and brings to the practitioner a digest of our present knowledge of neoplastic diseases. The subject is discussed in four sections, namely: Part I, Cancer in its General Relations; Part II, Cancer Research; Part III, Regional Cancer; Part IV, Radium and Roentgen Ray Therapy. A striking portrait of Dr. Ewing by Rebecca Linden Taylor is presented as frontispiece, and a masterful appreciation of Dr. Ewing's work is contributed by Professor William H. Welch. R. D. D.

Canadian Medical Directory 1930-1931. *Canadian National Publishing Company, St. Elizabeth St., Montreal,* 494 *pages. Price, paper* $7.00, *cloth* $10.00

The fact that such a directory is now in its thirteenth edition is evidence of the value of a Canadian medical directory to many persons and organizations. Although many difficulties face the publishers of such a volume, not alone the heavy financial burden but the inherent difficulty of obtaining prompt replies to question-forms sent to the physicians, dentists and druggists whose names should appear. The volume is a handy reference to the Canadian Medical Act and to the facts concerning the Canadian Medical Council. Each province is presented, giving the legal requirements for practice, the list of hospitals and sanatoria, the members of the medical faculties and as complete a list as possible of physicians, druggists and dentists. In addition to Canada, similar information is supplied for Newfoundland.

The only suggestion the reviewer would make is the inclusion of some form of index to the general items or a method of thumb-marking which would permit of rapid finding of the particular province desired. The publishers are to be congratulated on the volume. R. D. D.

NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

Prevention of Silicosis

"THE most striking step taken in this direction is the adoption of the 'Bulmer Air Mask' by the Government of Ontario, which has patented the appliance. When a supply of compressed air is available this appliance is considered of great value; indeed, some consider that it has solved the problem of dust-risk in the mining industry. Dr. A. S. Lanza, in New York, was as enthusiastic about the appliance as were Drs. G. C. Brink and A. K. Riddell in Toronto. Workmen use it readily and declare that they feel much fresher at the end of a work-shift than when without it."

This expression of appreciation by Dr. Patrick Heffernan, in the course of a paper entitled "Notes on Pneumokoniosis," in the current issue of "Tubercle," serves to direct our attention to the importance of the contributions which those engaged in the study of the problems of industrial hygiene are making in Canada.

"Nosokomeion"—International Hospital Review

This journal, which has just been

published by the International Hospital Association, will appear quarterly, containing articles in French, German and English. It will contain original articles by leading hospital administrators of many countries and will, undoubtedly, be one of the most valuable publications for reference. Dr. G. Harvey Agnew, Department of Hospital Service, Canadian Medical Association, has been honoured in appointment to the Editorial Board. The Editor is Dr. W. Alter Dusseldorf. The first volume (537 pages) was published a few months ago and copies are available at $3.00. It will appear in future as a quarterly of about 146 pages. Subscriptions ($3.00 per year) should be sent to W. Kohlhammer, Stuttgart, Urbanstrasse 12-16, Germany.

Survey of Morbidity from Heart Disease

The Division of Vital Statistics of the New York State Department of Health has arranged for a co-operative study of the morbidity from diseases of the heart. Approximately 1,000 physicians have joined in this effort to obtain definite information on this important subject. Heart disease occupies the first place in the causes of death. In New York State in 1929 one out of every four deaths was ascribed to this group of causes.

Canadian Chemical Association

CANADA now has a national chemical association, uniting the group of smaller bodies which have been actively functioning in the various special fields of chemistry. The Canadian Chemical Association was formed at a meeting recently held in Ottawa. Mr. J. R. Donald, of Montreal, was chosen as president, and Mr. J. Houston Wilson, who has been one of those who have contributed so much to the accomplishing of the scheme, was elected as secretary.

British Columbia

THE Greater Vancouver Health League in conjunction with the Canadian Social Hygiene Council held a very successful health exhibition in Vancouver during the week of November 10th. The attendance was excellent.

Miss Mary McPhee, Reg. N., has been appointed to the Department of Child Hygiene in the Vancouver City Health Department.

Alberta

DR. G. M. LITTLE and Dr. W. G. Saunders are taking post-graduate work in public health at the School of Hygiene, University of Toronto. On the completion of their studies, Dr. Little will assume the direction of the newly formed health unit at Red Deer, and Dr. Saunders of the unit at High River.

Alberta has now 22 municipal hospitals. The latest to be opened was the hospital at Peace River. It is of stucco finish and has a capacity of 14 beds.

Saskatchewan

AT the annual meeting of the Saskatchewan Hospital Association, which was held at the King George Hotel, Saskatoon, on November 11th and 12th, Dr. H. W. Lewis of Saskatoon was elected as president, and Dr. G. E. Patterson of Regina as secretary-treasurer.

Manitoba

THE construction at St. Vital of the new sanatorium costing, with equipment, approximately $750,000, is making rapid progress.

Commencing on December 16th last, a series of ten-minute talks, over the Manitoba Broadcasting Station C.K.Y., have been given on practical public health and welfare problems

by various members of the Department of Health and Public Welfare.

The following subjects are to be presented during the month of February: Feb. 3rd, Minor Maladies in Children, Dr. F. W. Jackson; Feb. 6th, Vital Statistics, Mr. A. P. Paget; Feb. 10th, Care and Protection Necessary for Clean Water Supplies, Mr. J. Foggie; Feb. 13th, Safeguarding of Public Milk Supplies, Dr. W. A. Shoults; Feb. 17th, Maternal Welfare, Hon. Dr. E. W. Montgomery; Feb. 20th, Mental Hygiene, Dr. A. T. Mathers; Feb. 24th, Disease Prevention, Dr. F. W. Jackson; Feb. 27th, Vital Statistics, Their Use to the Community, Mr. A. P. Paget.

It is with deep regret that we record the death of Dr. Jasper Halpenny, late director of the Department of Surgery, University of Manitoba. In addition to being one of the leading surgeons of Winnipeg, he took an active interest in many aspects of public health. In collaboration with his wife, he prepared a book, "How to be Healthy," which has been used extensively in Western Canada, as a text-book on hygiene. His loss is keenly felt by the entire profession.

The annual meeting of the Manitoba Medical Association will be held on September 8th, 9th and 10th, 1931.

The Cancer Relief and Research Institute has reported to the Manitoba Medical Association the progress which the Institute has made, stating that practically one gram of radium has been purchased, half of which is to be used for a radium emanation plant. This plant is to be constructed and operated within the next two months. One of the most difficult problems will be to decide who are qualified to use radium. The Institute feels that it would be a grave error to supply radium to any physician who is not fully qualified to prescribe and apply it. The treatment and research committee is now working on this problem and has asked the two large, teaching, general hospitals, namely, the General Hospital and the St. Boniface Hospital, to organize a clinic which ultimately would serve as training schools for those who wish to use radium therapy. It is hoped that in financing the Institute a sufficient income will be derived from the sale of radon emanations and of the use of radium elements to meet operating expenses and to pay the interest on the government loan and to provide a sinking fund for the repayment of the loan. Indigent patients will receive free treatment. Consequently, charges will have to be made for the use of radium in the case of those who are able to pay.

Ontario

THE Royal College of Surgeons, England, recently conferred the honorary fellowship of the college on Dr. Frederick G. Banting, discoverer of insulin.

It is with profound regret that we record the death, on Jan. 17th, of Dr. C. J. O. Hastings, LL.D., formerly Medical Officer of Health of Toronto. An extended obituary notice will be published in the next issue of the JOURNAL.

Subsequent to the promotion, some time ago, of Dr. B. T. McGhie from superintendency of the Ontario Hospital, Orillia, to become director of the Hospital Services in the Province, Dr. S. J. W. Horne, former senior assistant physician, has recently been appointed to the vacant post of superintendent and is succeeded by Dr. J. S. Stewart as senior assistant physician.

At the annual meeting of the Ontario division of the Canadian Red Cross Society in Toronto, it was stated that one hundred million dollars was spent annually on the cure of disease while only $2,700,000 was spent on prevention. Some counties in the province spend as little as seven cents

per person on the latter item. The most being spent on this is by the city of Peterborough, where prevention work is being done at the cost of $2.00 per person. The Honourable Dr. Robb emphasized what had been accomplished in the prevention of typhoid fever, and considered the same excellent results would follow a similar effort in the control of the other preventable diseases.

A Royal Commission has been appointed under Mr. Justice Middleton to investigate the effectiveness of the Workmen's Compensation Act of Ontario and to present recommendations as to revision and amendment. This action has been adopted after various requests from representatives of labour, such as the increased proportion of wages payable to railway personnel coming under the Act, and to modernize the Act, which has been in operation some fifteen years.

Quebec

UNDER the auspices of the Mental Hygiene Institute of Montreal, a series of small study groups for parents have been arranged. The purpose is to make possible a better understanding of the young child and of the ways in which his physical, mental and social growth can best be guided. The groups meet once each week for eight weeks.

Dr. James J. Guérin, of Montreal, was honoured by his colleagues of the staff of the Hôtel Dieu de St. Joseph at a dinner given to mark his completion of fifty years of service to the hospital. He was presented with a silver cup engraved with the names of the staff and with a silver facsimile of the record of his first patient who was discharged from the hospital cured. Dr. Guérin has been Clinical Professor of Medicine at the University of Montreal for many years.

New Brunswick

THE Hon. Dr. F. W. Roberts, of Saint John has been honoured by being elected president of the American Academy of Physical Therapy.

The new wing of the Moncton City Hospital, which was recently opened, gives accommodation to seventy-four additional patients besides supplying a new X-Ray department and enlarged quarters for the pathological laboratories.

Nova Scotia

THE retirement of Dr. A. Stanley Mackenzie as President of Dalhousie University, at the expiration of the present academic year has occasioned great regret. President Mackenzie has served for twenty years with great distinction to himself and to the university.

Following the meeting of the committees of the Nova Scotia Medical Society and the Provincial Health Officers' Association held last October to discuss the tuberculosis problem, a further meeting was called by Premier Harrington a few weeks ago. Dr. Miller of Kentville Sanatorium, Dr. Bayne of Cape Breton, and others specially interested in tuberculosis work were asked to be present.

Premier Harrington stated that the government would spend $300,000 capital account on sanatoria, and would set aside $80,000 to increase the per capita amounts to general hospitals treating tuberculosis patients. The committee made the recommendation, after most careful consideration, that $200,000 be spent at Cape Breton to increase the efficiency of the nursing service and home treatment. The proposed addition in Cape Breton will be provided by wards or annexes in a number of existing general hospitals on the Island.

We are indebted to the Nova Scotia Medical Bulletin for the details of this meeting.

At the ninth annual meeting of the Eastern Counties' Medical Society held at Antigonish, Dr. H. C. S. Elliot of Guysboro' was elected president.

CURRENT HEALTH LITERATURE

These brief abstracts are intended to direct attention to some articles in various journals which have been published during the preceding month. The Secretary of the Editorial Board is pleased to mail any of the journals referred to so that the abstracted article may be read in its entirety. No charge is made for this service. Prompt return (within three days) is requested in order that the journals may be available to other readers.

Comparison of the Dominick-Lauter Test for B. Coli in Water with that of "Standard Methods" —Eleven hundred and sixteen samples of water from 358 different sources were tested according to "standard methods A. P. H. A." and compared with the methylene blue bromocresol purple medium of Dominick and Lauter. The new medium was found to be far superior to standard lactose broth for the detection of B. coli in water.

Leahy, H. W., Freeman, J. W. and Katsampes, C. P., Am. J. Pub. Health, v. XXI, No. 1 (Jan.), pp. 11-18.

International Hygiene Exhibition, Dresden, Germany — An excellent account, illustrated with seven views of the grounds, buildings and interiors, describing particularly the permanent German Hygiene Museum around which the temporary exhibition buildings were grouped. More than twenty nations were represented in the "Place of Nations".

Dunham, G. C., Am. J. Pub. Health, v. XXI, No. 1 (Jan.), pp. 1-10.

Age Incidence of Communicable Diseases in a Rural Population— Findings of a study of certain communicable diseases as reported to county health department (Cattaraugas) during the period 1925-1929, and histories of prior attacks obtained by house to house canvass of a population approximately 5,000 (rural area).

A statistical study of importance to sound administrative practice, illustrated with simple graphs.

Sydenstricker, E. and Collins, S. D., Pub. Health Rep., v. 46, No. 3 (Jan. 16), pp. 100-113.

The Actual Tuberculous Morbidity and Mortality Among House Contacts of Sputum-Positive Cases in North Worcestershire, England —The area used in this study had a population of approximately 160,000 and the study was carried out from Jan. 1st, 1927, to Aug. 1st, 1929; 185 households, 833 contacts,—of these 647 were under 45 years of age. During the period of observation, 49 were considered as "suspicious", 52 were notified cases of pulmonary tuberculosis, 16 notified cases of non-pulmonary tuberculosis and 29 died of some form of tuberculosis. The results among children under 5 years are carefully presented, with observations of control groups in the Lancashire investigation, and show very significantly higher tuberculosis rates in the contact group.

The results must be considered only as the *early* results among contacts of group infection in the home. "All contacts of sputum-positive cases are themselves potential cases of tuberculosis". This is the proper point of view from the standpoint of the control of the disease, requiring periodic, careful examination with provision for proper preventive treatment.

Turner, H. M., Tubercle, v. XII, No. 4 (Jan.), pp. 145-155.

Mutation and Pathogenicity Experiments with B. C. G.—Is the strain of B. tuberculosis known as Bacille Calmette-Guerin, B. C. G., used by Calmette for the immunization of children and cattle against tuberculosis non-pathogenic? This paper is an extremely important contribution supporting the findings of Petroff, and of Watson, Lignières and others who have found that B. C. G. is more or less virulent and who have pointed out the possible dangers associated with the use of this vaccine.

Dreyer, G. and Vollum, R. L., Lancet, v. CCXX, No. 1 (Jan. 3), pp. 9-15.

The Occurrence of Tularaemia in British Columbia—The second report of this disease in Canada—the first by McNabb in February, 1930, in Timmins, Ontario, and now the report of the finding of *B. tularense* in a snowshoe rabbit near Vavenby, B.C., more than two hundred miles north of the United States border. It is likely that tularaemia in the Canadian fauna is a widespread infection of many years' standing.

Parker, R. R., Pub. Health Rep., v. XLVI, No. 2 (Jan. 9), pp. 45-46.

Studies on Leptospira Icterohemorrhagiae—Cameron in Toronto, and others in the United States, England and elsewhere, have shown the presence of leptospirae in the kidneys of wild rats. Examination of 50 rats in San Francisco has shown leptospirae in about one-third. The occasional outbreaks of epidemic jaundice in Canada and the possible relation of these to the finding of leptospirae in wild rats make this report of special interest.

Ridlon, J. R. U.S. Pub. Health Reports, v. XLVI, No. 1 (Jan. 2), pp. 1-5.

Immunization with Aluminum Hydroxide Mixtures of Poliomyelitis Virus—Poliomyelitis virus can be inactivated by suspensions of aluminum hydroxide. The virus when adsorbed on this reagent is incapable of producing the disease but is still capable of inducing active immunity in monkeys.

Rhoads, C. P., Science, v. XII, (Dec. 12), p. 608.

Diseases Produced and Prevented by Certain Food Constituents—In the published portion of this address, delivered before the section of Diseases of Children, at the American Medical Association's last meeting, diet and health, diet and the central nervous system and the relation of vitamin A to infection are discussed by Dr. Mellanby.

Mellanby, E. A., J. A. M. A., v. XCVI, No. 5 (Jan. 31), pp. 325-33.

Things New and Old—There are few medical writers in Canada who are the equal of Dr. David Stewart. In this masterful address which he delivered on the occasion of the visit of the British guests with the Canadian Tuberculosis Association to the Manitoba Sanitarium, Ninette, a complete survey is presented of our present efforts to control tuberculosis.

Stewart, D. A., Canad. M.A.J., v. XXIV, No. 1 (Jan.), pp. 9-16.

Experimental Study of a Horse Antipoliomyelitic Serum — Serum, citrated blood plasma, and "concentrated" serum, of one horse were tested for neutralizing power against a constant, potent filtrate virus of poliomyelitis. Well-marked power in *vitro* but less marked and irregular in *vivo*.

Rhoads, C. P. J. Exper. Med., v. 53, No. 1 (Jan.), pp. 123-135.